

March 26, 2001 Volume 18, Number 13

Network World

15th

ANNIVERSARY

1986

2001

15 years of incredible change

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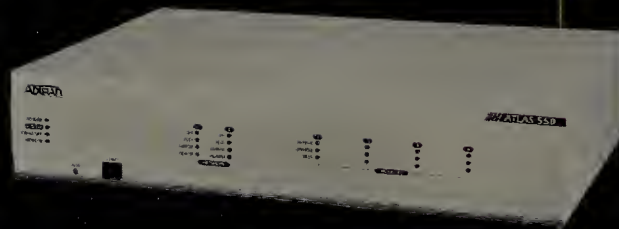
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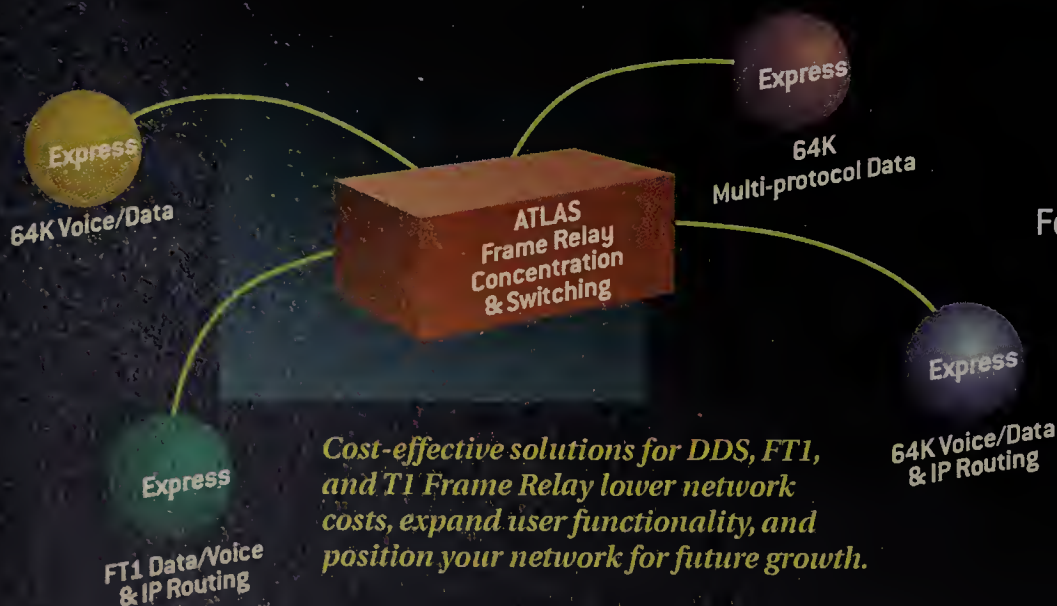
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THIS WEEK
ONLINE

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INTERACTIVE

Beware of political spam

Actually it's a new virus. This one spreads a political message and opens six Internet Explorer windows that point to pro-Palestinian Web sites.

DocFinder: 3546

The changing face of the IETF

Shrinking attendance caused by the financial woes of leading Internet vendors may not be a bad thing for the newly headed Internet Engineering Task Force. **DocFinder: 3547**

Cutting more costs

After a disappointing third-quarter loss, 3Com now plans to drop its Internet appliance line. **DocFinder: 3548**

FORUMS

New stackable multiservice switch

VoIP_ Expert finds Avaya Cajun P333T to be a great deal. Read the review and add your thoughts. **DocFinder: 3549**

Management war stories

We've set up a place to talk about your management battles and strategies. Got a war story of your own to share? **DocFinder: 3550**

March Madness

Don't forget to play Net Know-It-All this last week in March to be able to enter this month's drawing for \$500. **DocFinder: 3551**

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- **Experts Exchange** Get your tough network questions answered. **DocFinder: 9523**



CARUSO'S CACHE

The best of the NetFlash daily newsletter



HP creates new services unit

Time for Plan B. Hewlett-Packard pursued PricewaterhouseCoopers late last year to beef up its consulting and services business. But things didn't pan out after HP missed earnings. However, life goes on, and Hewlett-Packard is now working on increasing its own services business, with Ann Livermore at the helm of the unit. **DocFinder: 3557**

SSH inventor denied trademark request

Tatu Ylonen invented Secure Shell, but that didn't sway the Internet Engineering Task Force, which decided not to honor his request to change the technology's acronym to something other than "SSH." Ylonen is trying to protect the trademarks of his company, which also happens to be called SSH. One reader is already siding with the inventor: "In my opinion [the IETF] should at least have the courtesy to come to some compromise with [Ylonen]. If they don't, will this (and other decisions like this) deter other authors from bringing to light new and possibly better scripts/programs/tools?" **DocFinder: 3559**

Technology can make a difference, Carter says

When it comes to elections, Venezuela is more technologically advanced than the U.S., according to former President Jimmy Carter. Speaking at the Cellular Telecommunications & Internet Association Wireless 2001 conference, he said Venezuelans have a completely electric voting system, avoiding the punchcard mess we poor Americans experienced last November. **DocFinder: 3558**

— Jeff Caruso, managing editor, online news

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COLUMNISTS

Compendium

Googling anyone?

Fusion Executive Editor Adam Gaffin finds a new Google phone number search feature and points us to Internet research news at researchbuzz.com. **DocFinder: 3552**



Keeping Current

Investment advice

Fred McClimans has a friend whose broker is urging her to invest in 'Net-related stocks now because they're so low they have no place to go but up. McClimans disagrees. **DocFinder: 3553**



Help Desk

NetWare and Windows NT

Ron Nutter advises a reader on the differences between NDS Account Manager and DirXML technology. **DocFinder: 3554**

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News

Patent flap slows multilingual domain name plan

BY CAROLYN DUFFY
MARSAN

MINNEAPOLIS — Intellectual property claims have blindsided the Internet Engineering Task Force and could derail the group's efforts to develop a common scheme for supporting foreign-language domain names across the Internet.

Creating communications protocols for internationalized domain names is one of the most significant efforts under way within the IETF, the Internet's premier standards-setting body. The IETF is under pressure from Internet users outside the U.S., who want domain names in their native languages instead of the English-language alternatives available today.

"What people want is to buy domain names with words and



STEVE WOIT

phrases from the real world," says John Klensin, head of the IETF's Internet Architecture Board. "This is a very tough issue. . . . Internationalizing the domain name system is the most difficult challenge we have faced since we deployed the Internet Protocol."

Indeed, the task is so tricky that the Internet Corporation for Assigned Names and Numbers and the world's country code operators agreed to wait until the IETF's develop-

"Internationalizing the domain name system is the most difficult challenge we have faced since we deployed the Internet Protocol."

John Klensin, head of the Internet Architecture Board, IETF

ment work is complete before supporting foreign-language domain names.

However, the Internet user community may have to wait longer than it expected. The IETF's Internationalized Domain Name (IDN) working group recently discovered that an Ann Arbor, Mich., start-up named Walid received a patent on Jan. 30 that appears to cover many aspects of the technical solution developed by the working group.

This solution involves converting foreign language characters into Unicode, a computer industry standard, and then encoding them in U.S. ASCII for transmission over the Internet. It creates a presentation layer to display domain names to end users in their native languages. The advantage of this approach is that it requires no changes to the DNS protocol or existing DNS servers.

Walid filed paperwork with

the IETF claiming that it will seek licensing fees "based on reciprocity" if this approach is adopted in the group's final standard.

IETF officials last week asked Walid to reconsider and instead license the patent for free to all interested parties. If not, the IETF will likely scrap this approach and start over, which could make Walid's patent worthless.

IDN working group chair Marc Blanchet says he expects to hear from Walid within a

See IETF, page 30

More on IETF:

- Cisco's Alves-trand discusses new role as chair.
- Economy to blame for reduced attendance. Page 30.

Users give Novell a to-do list

BY DENI CONNOR

SALT LAKE CITY — A number of Novell customers say they attended last week's BrainShare conference primarily to take stock of the company's evolving e-business strategy and incoming CEO.

What they heard left them hopeful, wary and willing to offer advice to a financially strapped company some fear could be acquired, sold off in pieces or suffer a withering of the technology that once had Novell atop the network business. They implored the company to:

- Distance itself from its legacy operating system and concentrate on applications that use the directory to solve business problems.

- Reinforce and deliver technology with affordable consulting and implementation services through the acquisition of Cambridge Technology Partners.

- Jettison development of products such as BorderManager and NetWare as an application server platform that drain company resources.

- Target marketing efforts to the highest corporate levels as answers to business problems, rather than technology alone.

"The [Cambridge] relationship, if executed properly, will reinforce Novell's ability to deliver product and solutions," says Doug Lionberger, director of technology services for credit verification company Trans Union in Chester, Pa.

Lionberger says companies such as his require help with emerging products such as Novell's iChain or DirXML e-business security and access packages.

"There is no doubt that some of the technology Novell has brought to market requires certain implementation skill sets that will drain existing Novell Consulting resources," Lionberger says. Currently, Novell

employs 300 consultants. The Cambridge acquisition brings another 2,800 consultants into the fold. As Cambridge's consultants learn Novell technologies, they will be able to design, implement and execute within Novell's One Net strategy, observers say.

CEO-designate Jack Messman says Novell's e-business products "like NDS eDirectory, DirXML, iChain and the Volera Excelsior" are compelling applications that will increase the use of Novell products and ensure the company's success.

Novell and Cambridge plan to deliver these products by combining their focus on eight vertical markets that span the enterprise. Novell has concentrated on healthcare, education, insurance and government markets, while Cambridge is tuned to the financial, communications, energy and manufacturing industries.

Mark Starry, enterprise archi-
See Novell, page 27

SCHMIDT REVELS IN NEW ROLE

THE question was front and center last week at BrainShare: What's up with Eric?

Eric Schmidt, who is stepping aside as Novell CEO to assume the role of chief strategist, told *Network World* he is "relieved and excited" to return to technology and development. "I'm glad to be able to let [CEO-designate Jack Messman] handle the day-to-day money matters and shareholders," he says.

Schmidt talked animatedly about directories, authentication and user personalization at a press conference after his BrainShare keynote address. "Now I can talk about these things without having to make a business case for it. That's Jack's job."

Schmidt says he initiated acquisition talks with Cambridge Technology Partners some nine months ago after McKinsey & Associates and Morgan Stanley Dean Witter recommended the consulting company as a fix for Novell's financial problems and flagging sales. He says it was his suggestion that Messman take the role of CEO.

Rumors are swirling on Schmidt's future with the company, including that he might return to Sun, where he served as CTO.

He says he plans to relax by working with technology.

— Deni Connor



Outgoing Novell
CEO Eric Schmidt

NEWS BRIEFS, MARCH 26, 2001

Security director moving on

Michael Vatis, founder and first director of National Infrastructure Protection Center, last week left that post for a job at Dartmouth. NIPC is an interagency organization designed to detect and warn about cyber attacks. It is housed within the headquarters of the FBI. Vatis will become director of Dartmouth's Institute for Security Technology Studies, founded in 1999 for research on the protection of telecommunications and information infrastructures. At the same time, the FBI announced the appointment of Ronald Dick as director of the NIPC. Dick had been an FBI special agent since 1997 and before that served as chief of the FBI's computer/financial institution crimes unit.



Vatis to become the director of Dartmouth's Institute for Security Technology Studies.

Corporation." VeriSign says it began investigating the incident, which it blamed on human error, but that it was two weeks before the certificates were actually revoked. The holder of the bogus certificates could use them to digitally sign code indicating it was a product from Microsoft. There have not been any reports the certificates were used. Microsoft is testing a software update to address the problem.

Commerce One grabs Exterprise

Consolidation continues among business software vendors. Business-to-business software maker Commerce One last week announced plans to acquire Exterprise for \$78 million in stock. Exterprise is a privately held company in Austin, Texas, which develops collaborative commerce platforms and applications for marketplaces. Commerce One will integrate Exterprise's software into its MarketSite by the first quarter of 2002.

Citrix Systems snaps up Sequoia

Citrix Systems will buy Sequoia Software for \$184.6 million, the companies announced last week. Sequoia makes XML-based software for building Web portals. Citrix, which makes connectivity software for application servers, hopes to add Sequoia's portal products and technology to its portfolio, company executives said. Citrix's MetaFrame software connects client computers to central servers, saving companies software licensing costs by keeping expensive applications on servers, to be accessed as needed through workstations.

IETF rejects SSH inventor's plea

The Internet engineering community rebuffed one of its own security gurus last week by rejecting a request from the inventor of the popular Secure Shell protocol to change the technology's acronym to protect his trademark on the term. Tatu Ylonen created Secure Shell in 1995 as a way of securing remote logon, file transfer, TCP/IP and X11 forwarding. Ylonen published Secure Shell as free software, and the technology is now available from several software vendors.

Ylonen's company, SSH Communications Security of Finland, sells a suite of cryptography and authentication products based on the protocol. Secure Shell has been commonly referred to as SSH. As the Internet Engineering Task Force wraps up its work to standardize Secure Shell, Ylonen asked the group to change the acronym to Secsh or another phrase to protect his trademarks. The IETF's Secure Shell working group denied the request, citing concerns it would set a bad precedent for other such trademark claims. "I'm very disappointed," Ylonen says. "What will I do next? Consult my lawyers."

Woes mount at Infonet, E*spire

Multinational telecommunications service provider Infonet Services will likely be put up for sale by shareholders. The service provider hired UBS Warburg and Merrill Lynch to try to find a buyer or an alternative deal that will reduce the company's debt. Infonet has several large international telecommunications shareholders, including Koninklijke KPN in the Netherlands, Telefonica in Spain, Telia in Sweden, KDD in Japan and Telstra in Australia.

Meanwhile, domestic competitive local exchange carrier E*spire in Herndon, Va., has financial difficulties of its own. The CLEC filed for Chapter 11 bankruptcy protection last week. The company says it will continue to support its customers during the reorganization period.

Why is Iridium unlike the Mir?

Iridium is getting back on its feet. The satellite telecommunications company, which was on a respirator at the end of last year, is expected to launch commercial voice services next week. Iridium Satellite bought Iridium for \$25 million last year just as Iridium was planning to take its satellites out of service. In December, Iridium Satellite nabbed a two-year, \$72 million contract to provide satellite telephone service to the federal government, thereby breathing life into the failing company.

VeriSign issued bogus certificates

VeriSign acknowledged last week it had issued two digital certificates in January to someone posing as a Microsoft employee. The certificates bear the name "Microsoft

BellSouth introduces more flexible frame relay

Subrate T3 fills void between T-1 and T-3.

BY MICHAEL MARTIN

ATLANTA — BellSouth last week filled the gap between T-1 and T-3 frame relay, rolling out a service that's less expensive than cobbling together T-1s.

Called Subrate T3, the service lets customers scale bandwidth upward from the 3M bit/sec they would get with two T-1s to the 45M bit/sec of a T-3 line.

To move beyond a single T-1, a customer could purchase additional T-1s, set up separate logical permanent virtual circuits and split data traffic among the T-1s. An alternative

bandwidth, the sales representative is called, and the bandwidth will be turned up within about five business days with no new equipment required and no additional installation fees.

"You've got the pipe," Spencer says, "all we have to do is open up the nozzle a little."

Installing new T-1s can take months, he says, and requires customers to pay for additional customer premises equipment.

The Subrate T3 service is more reliable than multiple T-1s, he says, because it's based on fiber rather than copper.

While some new metropoli-

How BellSouth's Subrate T3 service stacks up

The new offering is more cost effective than a typical alternative — bonded T-1s — as users sign on for higher speeds.

Subrate T3:

- Begins at \$2,045 per month for 3M bit/sec and goes to \$2,145 per month for 6M bit/sec.
- Additional bandwidth is as low as \$160 per month for a 3M bit/sec increment.

Bonded T-1s:

- Two T-1s (3M bit/sec) start at around \$1,600 per month.
- Four T-1s (6M bit/sec) start at around \$3,200 per month, plus the cost of new premises equipment.

would be a bonding solution that ties together T-1s to form one logical link.

The bonding service is a good option if a customer only needed to tie together two T-1s, says Joe Spencer, a BellSouth product manager. Beyond that though, bonding didn't make a lot of sense.

"The problem is that while the service was affordable for 3M bit/sec, at 6M bit/sec the price became very high, and above that you were just as well off going with a T-3," he says.

Subrate T3's pricing makes it a viable option for bandwidth between 3M and 45M bit/sec, Spencer says (see graphic).

Price isn't the only thing BellSouth's new service has going for it. Subrate T3 relies on a fiber-based T-3 connection to a business site.

BellSouth throttles back the bandwidth on the pipe based on the speeds a customer demands.

If a customer requires more

tan Ethernet services promise more bandwidth than frame relay for less money, Spencer says that Ethernet in the WAN isn't widely deployed and doesn't have frame relay's solid track record.

"Frame relay works well and everyone knows how to use it," he says.

Ron Kaplan, an analyst with market research firm IDC, says BellSouth is the first provider he knows of that's providing frame relay service between T-1 and T-3 speeds without relying on bonded T-1s.

While frame relay may not be a hot new technology, Kaplan says it's certainly a booming business. IDC placed frame relay revenue at about \$6 billion in 2000 and expects the market to more than double to \$13 billion by 2005.

Subrate T3 is available immediately throughout BellSouth's service area.

BellSouth: www.bellsouth.com



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Your ASP has closed shop: Now what do you do?

Demise of Agillion raises anew concerns about how to recover from application service provider disasters.

BY JENNIFER MEARS

AUSTIN, TEXAS — Application service provider Agillion is operating with a skeleton staff these days: 20 employees, mostly developers, who are supporting the company's existing customers as executives shop for a buyer.

It's another casualty in a tough funding market that is creating woes for more than just ASPs. Companies big and small are dealing with hard times as the economy slows.

For companies wary of the still young ASP market, however, the recent demise of several firms is cause for concern. What do you do if your ASP goes under? How do you know if it will? There are no easy answers, but the experience of one jilted customer offers a few clues.

Since last summer, several ASPs have fallen by the wayside, including Pandesie, a joint venture between Intel and German software firm SAP; Red Gorilla, which offered an online time and billing application; HotOffice.com, a virtual office services company; and iSearch, which marketed Web-based recruiting applications.

Robin Muhlheim, senior manager of staffing and development at ESI, a Portland, Ore., manufacturer and designer of parts for electronics, was an iSearch customer. Last November, ESI went live with iSearch's online recruiting service. In February Muhlheim got a call saying the ASP was going under. Now Muhlheim is looking for another ASP.

"It's like a crapshoot again — who is going to be left stand-

Signs of trouble

AMR Research offers five warning signs that your ASP is on the decline:

- **Excessive marketing** — Market dominance comes from years of solid execution, not flashy ads.
- **Lack of focus** — A new ASP claiming to support many apps across numerous industries with a few hundred people is probably overextending itself.
- **Very short or long customer list** — A 2-year-old ASP with six customers isn't encouraging. A start-up with 40 or more customers could have trouble serving them all well and could run into cash-flow problems.
- **Funding not in line** — Firms that don't get significant funding won't last. If the money's gone, so are they.
- **Customer feedback unavailable** — If the ASP can't offer customer metrics and references quickly, there's a problem.

ing?" Muhlheim says. "Hopefully we pick that one."

For years, ESI had used a manual system to handle resumes and the hiring process. But with more than 20,000

resumes flooding their offices in the past year alone, executives decided it was time to outsource the process. Muhlheim says ESI looked at eight ASPs before settling on iSearch, and it took four months to implement the system.

Now that she's in the selection process all over again, Muhlheim says that in addition to cost and functionality, an ASP's financial situation will be a key factor in any decision.

"Last time we pretty much just took iSearch's word that they were in good shape," she says, adding that she checked out the company's customer list, which included names such as Sears, and called references. Now Muhlheim says she's talking with CFOs and getting a look at financial statements. "It's definitely a lot more escalated this time. But even with all that there's no guarantee."

Nevertheless, Muhlheim remains committed to the ASP model and says that ESI saves time and money by not handling the software in-house. For the moment, ESI is one of about a dozen former iSearch clients that have turned to BrassRing, an ASP that also hosts a Web-based recruiting service. BrassRing offers a 48-hour installation and a month-to-month contract, which lets companies leave whenever they choose without penalty.

Muhlheim says BrassRing lets ESI keep an active Web page for job candidates while the company decides what to do next. And the thousands of ESI resumes that were stored on

iSearch servers?

"They told me that we would receive [the data] two weeks ago," Muhlheim says. "I'm holding my breath that that tape arrives." iSearch did not return phone calls from *Network World*.

Just in case, she says, after hearing about iSearch's pending closure, she and her staff spent about a week manually pulling all information about candidates they were interested in off the system and printing it.

Data recovery is one area that experts agree businesses should focus on when negotiating with an ASP. Muhlheim says ESI did have an exit strategy in place in case of problems.

"But really all you can do is ask for your data back," she says. "It just comes down to that."

As for Agillion, a spokeswoman says the company will continue to support existing customers and plans to transition them to an Agillion buyer.

Agillion seemed positioned to make it through the long haul. Launched amid much fanfare by technology industry veterans Steve Papermaster and Frank Moss in 1998, the company reeled in more than \$40 million in funding from investors that included Goldman Sachs and Cisco in 1999.

But the firm was stymied by a tough funding climate this winter and was unable to get a second round of investments. It had secured about 70% of the \$30 million it was seeking, but when it couldn't close on the balance, all the investors pulled out.

"You look at that and say, it doesn't matter what company, it doesn't matter what kind of management team," says Diane Myers, program director for ASP Competitive Strategies at market research firm Stratcast Partners.

Myers and other analysts expect a shakeout in the ASP market over the next year. Gartner Group, in fact, predicted last summer that 60% of ASPs would fail by next year. At the same time, analysts also agree that ASPs will not go away, but will grow into a multibillion-dollar market by 2004. The question is who will be there to share the multibillion-dollar pie. ■

Fading PSINet has users in limbo

Observers say ISP appears to be headed for bankruptcy protection.

BY DENISE PAPPALARDO

ASHBURN, VA. — Just over a year ago, PSINet announced a \$1 billion program to help fund Internet start-ups. Now it looks as though the company should have squirreled away some of that cash for itself.

Experts say the once mighty ISP is most likely headed for bankruptcy protection and that customers should prepare contingency plans. PSINet is carrying a debt load of \$3.6 billion and has watched its stock plummet from \$60 a year ago to a mere 13 cents last week.

If the next part of the PSINet story is Chapter 11 and creditors take ownership of its network, it's unlikely creditors will manage and operate the network, says Steven Harris, an analyst at market research firm IDC.

"Creditors will want to sell the network," he says. "The buyer could be a service provider that may resume services, but there could be a period where the network will be shut off."

While PSINet is trying to



MARK ESCHER

avoid defaulting on payments to creditors, the ISP's thousands of small and midsize business customers are left with a heavy dose of uncertainty.

"We've had network contingency plans in place for over a year," says Glenn Botkin, IS engineer at Galaxy Scientific, an Egg Harbor Township, N.J., engineering firm. But the company isn't making any changes just yet.

"They're not going to shut the network off overnight. At least that's what they've implied," says Botkin, whose company is using PSINet's

"They're not going to shut the network off overnight. At least that's what they've implied."

Glenn Botkin, information systems engineer, Galaxy Scientific

managed IntraNet service to link its seven corporate sites.

PSINet has struggled as a result of many of the same problems of other competitive local exchange carriers, ISPs and even traditional telecommunications companies. It's costly to build and maintain multinational networks while trying to drum up new business. Some say the company's headstrong CEO, Bill Schraeder, probably could have sold the company months ago but never thought any price was high

See **PSINet**, page 20

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Outsourced VoIP technology gains momentum

Small firms expected to adopt IP Centrex and the like first, while enterprises may prove to be a tougher sell.

BY PHIL HOCHMUTH

PHOENIX — While many companies may wait for their PBXs to die before diving into voice over IP, the technology could find its way into other corporations soon as an outsourced service, such as IP Centrex.

Analysts say such emerging services can be as feature-rich as circuit-switched phone systems found in the largest companies and could prove to be priced just right for smaller firms. Vendors displayed a slew of products last week at the Voice over the Net show in Phoenix that are aimed at speeding delivery of such voice-over-IP services to market.

"IP telephony will enter the enterprise from the outside in [as a service] much faster than enterprises will implement IP PBX solutions themselves," says Tom Valovic, an analyst

with market research firm IDC.

The research firm estimates the number of voice-over-IP minutes used worldwide by businesses will balloon from about 497 million minutes this year to 127.5 billion minutes by 2005.

Valovic says small firms will lead the way in adopting voice-over-IP services and advanced IP-based telephony features, such as unified messaging and voice-enabled applications.

"A lot of companies will be attracted to the service model because they don't want to mess with this stuff themselves," he says. "Bigger enterprises that are more staffed up may be different."

While regular Centrex is nothing new to small and mid-size businesses, "what will be appealing to business users are the features that IP Cen-

IP PBX vs. IP Centrex

Users sold on VoIP, but unsure whether to use a service or buy an IP PBX should consider these factors:

- **Company size:** Larger organizations with an IT staff that once supported a PBX system may want to consider IP PBXs. IP PBXs are geared to support more users than outsourced VoIP services.
- **Up-front costs:** IP PBX systems can cost \$200 to \$800 per user to install, while IP Centrex costs around \$25 to \$30 per month.
- **Features:** Both IP PBXs and IP Centrex offer features that take advantage of convergence, such as unified messaging and interactive voice response. IP PBXs often require hardware and software upgrades to implement these features, while IP Centrex users can just order them over the Web.

trex will offer that take advantage of the services' converged nature," says Bert Davenport, IP telephony product manager for CommWorks. The 3Com subsidiary last week demonstrated a system to enable carriers to sell IP Centrex services to business subscribers. The system compris-

es a Session Initiation Protocol (SIP) Proxy server, Total Control 1000 Media Gateway and SIP phone products.

IP Centrex could include policy-based applications that handle calls which follow rules users set on their PCs, or tools that allow administrators to add users and features

quickly through a Web interface, Davenport says.

WorldCom is currently selling IP Centrex to small and midsize businesses using 3Com's equipment.

"Having just a [voice-over-IP] service that gives dial tone and basic features [such as call forwarding, transfer and hold] is not that exciting," says Ralph Hayon, CEO of Congruency, which makes softswitches and IP phones that underpin voice-over-IP services for business customers.

Congruency's CNS 3200 Hosted Communications Platform enables carriers to offer phone services such as "find me/follow me" — which allows an end user to have calls forwarded to different numbers until the call is answered — as well as unified messaging. The software also allows customers to change

See **VoIP**, page 27

Multinational VoIP services getting a boost from Equant

BY DENISE PAPPALARDO

Multinational service providers are beefing up managed converged network services with new guarantees and cost-effective call-routing features.

Last week Equant announced service-level agreements (SLA) for its Integrated Voice and Data (IVAD) service that guarantees call quality. Also, Global One announced enhanced call routing, which the company says will more cost effectively route calls over its Global IP VPN voice-over-IP service.

IVAD lets users in 55 countries establish voice and data VPNs that are fully managed by Equant. The company's new SLA guarantees that 99.5% of calls will be completed and that users will not experience more than 6 seconds of delay between the time they finish dialing and when they hear ringing or a busy signal. The SLA also guarantees that 95% of fax traffic

will be transmitted at 9.6K bit/sec.

Equant also has deployed software that it calls Telephone Quality Analyzer, which

Voice guarantees

Equant is a service-level agreement for its voice-over-IP VPN customers. This SLA accompanies the company's data-specific guarantees. The VoIP SLA assures:

- 99.5% of outgoing calls will be completed.
- Less than 6 seconds of delay between dialing a number and hearing a ring/busy signal on 95% of calls.
- 95% of all fax transmissions will be sent at 9.6K bit/sec.
- Compensation is determined on a case-by-case basis during contract negotiations.

measures the quality of voice calls on the network. The system specifically picks up packet loss, latency and noise levels. The Telephone Quality Analyzer rates calls from one to six, and Equant guarantees 95% will score three or higher.

This is Equant's first voice-traffic SLA, which more busi-

nesses want as they add voice to their data networks, says Brownlee Thomas, an analyst at consulting firm Giga Information Group. Global One and

Global One's parent company and Equant are in the process of a \$300 million complex merger that will integrate Equant and Global One. The merger has been approved by international and domestic regulatory bodies.

The companies expect the merger to be final by midyear. "My advice to clients is to renegotiate their contracts in light of the merger and insist on the best of either company's SLA," Thomas says.

Equant customers can now view weekly and monthly call detail reports online.

"The reports include outgoing calls so managers can easily bill back to departments. The reports also include the monthly voice and data performance statistics," says Dan da Costa, director of IP enhanced services at Equant.

Global One, Equant's soon-to-be corporate cousin, has been enhancing its Global IP VPN VoIP service, which lets users establish voice and data VPNs in

80 countries. The multinational carrier has deployed a Netcentrix VoIP VPN Gatekeeper softswitch in its network, which supports "best-cost routing," says Tom Wyrick, vice president of market development.

The gatekeeper can determine the best route for calls that are headed off Global One's data network to the public switched telephone network. The device looks for the least congested route and the route that will terminate the call closest to its final destination, Wyrick explains.

These converged services are for multinational companies that have a significant amount of intracompany voice and fax traffic, Giga's Thomas says. In some cases users can save up to 50% compared with supporting separate voice and data networks. But Thomas points out that these savings are typically between U.S. and the Middle East or Asia for example, not on transatlantic routes. ■

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Microsoft fills in more details of 'Net software plan

Company unveils Web services; partners to create devices to access them.

BY JOHN FONTANA

REDMOND, WASH. — Microsoft last week added a few more pieces to .Net, the company's still unclear vision of delivering software over the Internet to PCs and other devices.

The company announced partnerships with wireless handset and device manufacturers, and software components called HailStorm that can be delivered through those devices. It's all part of Microsoft's .Net strategy, which the company has been rolling out in pieces since June.

"They announce this over here and that over there, but it will be some time before we see the piece that links it all together and makes it work," says Dan Kusnetzky, an analyst with market research firm IDC.

HailStorm, which Microsoft describes as a set of Web services, and the new "smart" devices are two key parts of



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"We need to be pioneers of this notion of phones that fully participate through .Net."

Steve Ballmer, CEO, Microsoft

.Net. Web services that are chunks of code that can be embedded in applications or

stitched together to form unique applications. Smart devices such as wireless phones, pagers and PDAs are key to .Net's promise of any-time access from any device.

"We need to be pioneers of this notion of phones that fully participate through .Net," said Microsoft CEO Steve Ballmer during his keynote address at the Cellular Telecommunications and Internet Association annual show in Las Vegas last week. "We see it as fundamentally important to the [.Net] vision ... to make sure that there are devices that can fully participate in a software sense in this next-generation revolution."

Microsoft announced deals with High Tech Computer, which will embed Microsoft's Stinger software into its phone handsets. Stinger, set to ship at year-end, combines PDA and phone features in one device. Samsung, Sendo and Mitsubishi have already

announced support.

Microsoft also said J.D. Edwards will enable its OneWorld enterprise resource planning application to work on the Pocket PC, a Windows-based PDA platform, to allow real-time data access.

Stinger and the Pocket PC have been touted as key .Net devices.

The first set of services available to those devices is HailStorm, which is built on XML and the Simple Object Access Protocol.

HailStorm is based on Microsoft Passport, an online user authentication service, and is a set of Web-based services with catchy names such as myProfile, myCalendar, myWallet and myNotifications.

Passport provides the authentication to the services, which can be built into applications.

The services provide access to personal data stored centrally on the Internet. Any

device, person or application that has implicit permission can read the data.

For example, users could let a travel agent update their calendars and send notification of the changes.

Microsoft also plans to run HailStorm as a business, serving as a clearinghouse for all the data needed for HailStorm services.

For example, the Passport data including authentication and credit card information will be stored in Microsoft data centers.

Observers were quick to raise security concerns, which have historically plagued Microsoft software.

Microsoft took great pains to say it would not mine the stored data and said users will control who sees what and when and for how long.

The services, expected to be available early next year, will be fee-based, but Microsoft did not disclose pricing. ■

Symantec aims to make desktop management less taxing

BY DENISE DUBIE

CUPERTINO, CALIF. — Symantec next week will roll out an upgraded management package designed to reduce time spent manually administering to end users' desktops.

The latest version of Symantec's Ghost offering lets net administrators use a single console to:

- Capture individual user profiles for migration from one desktop to another.
- Automate software and upgrade distribution across local and mobile environments.
- Create incremental snapshots of PC data for up-to-date remote backups.

Ghost 7.0 also includes a feature for "waking up" PCs connected to a LAN, but not in use, to perform system upgrades or backups.

Ghost competes with products such as PowerQuest's DriveImage, Altiris' RapiDeploy and Innovative Software's

Imagecast IC3.

Ghost's enterprise console software is installed on a dedicated server and can push an executable out to PCs that need to be managed. Net managers select the drive or drive partition they want to create a disk image for, and Ghost creates an image file of the system and saves it on the console server. With that information available at one console, net managers can remotely administer PCs.

Andrew Batson has been using Ghost on Clarkson University's 5,000-node network since Version 3.0. As a senior support specialist, he says Ghost helps his department more easily upgrade and move users. Ghost also lets him replicate 10G-byte images into Clarkson's computer labs

without having to go from workstation to workstation.

"We do a lot of work with end users moving from one system to another, and Ghost gives us the ability to create user

packages and easily upgrade those end users," Batson says.

He's been tinkering with the beta-test version of Ghost 7.0, but has yet to use it across Clarkson's network. Symantec's

new feature for creating a centralized "personality migration" strikes him as particularly interesting because of the many changes his end users request. The incremental back-up features will also make his life "a whole lot easier," Batson says.

He says Ghost is a big time saver for him, although he'd like to see Symantec improve the package's reporting features by adding a type of

graphical representation of all the information the program captures. Batson says that data could show his managers where and how the system could be improved.

"Pictures and numbers could help with management who don't completely understand the technology," he says.

Ghost 7.0 costs \$15 per node for a 100-node network.

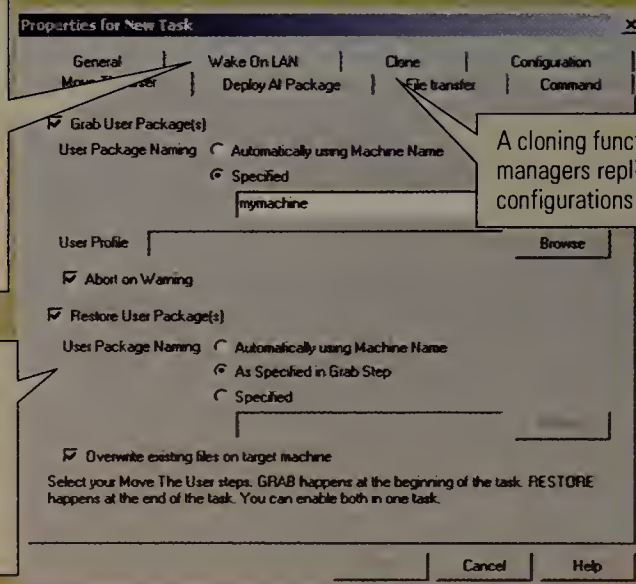
Symantec: www.symantec.com

Ghost with the most

Ghost 7.0 lets net managers remotely configure PCs.

Net managers can assign new PC configurations to remote workers not connected to the network with the "Wake on LAN" feature. It updates a telecommuter's PC when the person logs on to the network.

Working from the Ghost console, a net manager can set up a new user or change an existing user's PC configuration.



A cloning function lets net managers replicate PC configurations across desktops.



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NetIQ fills out Windows management line

AppManager 4.0 can monitor more apps, work with other mgmt. tools.

BY DENISE DUBIE

SAN JOSE — For customers with Windows-centric networks, NetIQ's systems and applications monitor upgrade introduced today means they should be able to better track the performance of key network applications.

AppManager 4.0 can now be used to monitor a handful of additional applications, including Microsoft's .Net servers, such as Exchange Server 2000, Commerce Server 2000 and Internet Security and Acceleration Server 2000. NetIQ has also added support for managing security products, such as those from Check Point Software and TrendMicro, and includes a module for tracking availability and performance of e-com-

merce programs.

Also new is a Web-based console for viewing management reports, plus integration with other management tools from Micromuse, Remedy and Pegasus. Given that NetIQ's offering is so Windows-centric, the integration with other management systems is key for users of mixed operating systems.

"While there are many companies that run a lot of Windows, many also depend heavily on Unix systems and would want a composite view of their infrastructure," says Audrey Rasmussen, an analyst with Enterprise Management Associates. "However, NetIQ's alignment with Microsoft is a strength for now. NetIQ is partnering with a growing number of vendors, which is great for customers."

Peter Lundsgaarde, systems engineer at Maryville Technologies, an IT firm that offers systems design, integration and project management, says his company chose AppManager because it offers a "diverse and scalable" way to monitor Windows environments. He says the improvements NetIQ has made address his company's need for more data collection and reporting features. Maryville, which uses AppManager to monitor networks with 50 to 400 Windows NT/2000 servers, would still like to see more "out-of-the-box monitoring definitions," Lundsgaarde says.

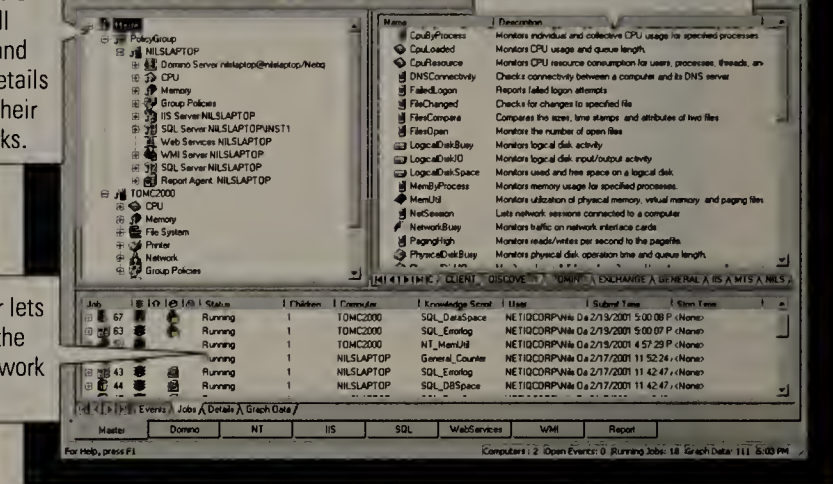
Watching your Windows

NetIQ's AppManager 4.0 lets users see deeper into Windows networks.

Network managers can drill down and view details about their networks.

AppManager lets users know the status of network elements.

Users can drag-and-drop predefined policies to selected network devices.



AppManager includes a repository that typically is installed on a dedicated SQL Server or Win 2000 machine

and agents that run on servers being monitored. The agents run scripts that communicate management information back to the repository. Users can view the information from a Windows Explorer-like view, a Web-based console or a snap-in console. Users can automate the distribution of knowledge scripts, which offer predefined policies, by dragging and dropping them onto servers or groups of servers on the viewing console. AppManager can be configured to send alerts when thresholds are exceeded or to take corrective action.

NetIQ is going up against vendors such as Bindview, Fastlane Aelita, and Computer Associates. AppManager competes directly with BMC Systems' Patrol management product.

AppManager pricing is per monitored server and application. Base price per server is \$600. This provides NT and Win 2000 monitoring. Additional modules range in price from \$150 for hardware monitoring to \$1,200 each for Exchange, SQL and other applications. Consoles cost \$2,500 each.

Separately, NetIQ recently announced two products for helping companies migrate to Win 2000 and Exchange 2000. Exchange Migrator transfers Exchange 5.5 mailboxes, distribution lists, public folders and calendar objects. Migration Assessor keeps an eye on the computing environment in migrations to Win 2000, Active Directory and Exchange 2000.

NetIQ: www.netiq.com

Web server clustering for Windows-centric sites

Microsoft Application Center 2000 has some rough edges; load balancing is simplistic.

BY THOMAS POWELL,
NETWORK WORLD
GLOBAL TEST
ALLIANCE

High availability and scalability are desirable for any Web site. Unfortunately, far too often high prices for software and hardware, in conjunction with complex implementations, have kept the solution to these problems — through the load balancing of relatively low-cost servers — out of reach for many Web professionals.

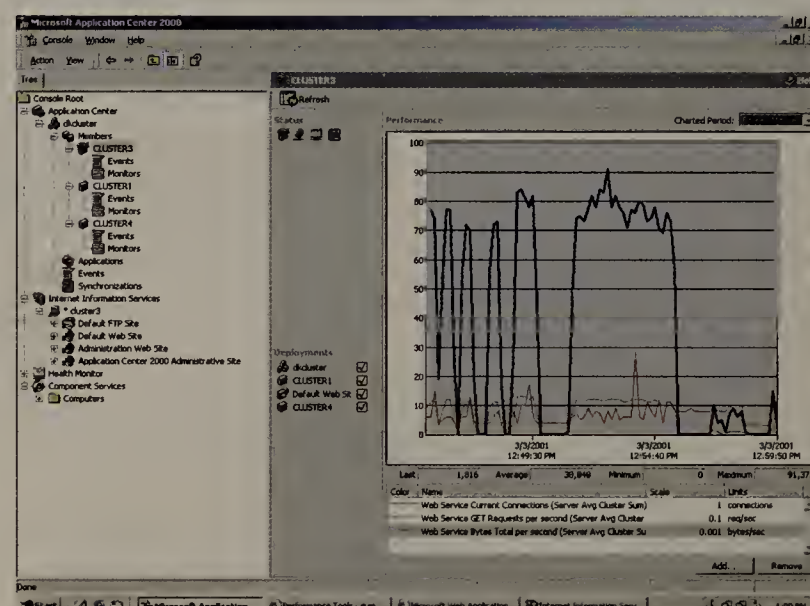
Microsoft Application Center 2000 promises to bring software-based scalability of Web sites down to the realm of the mere mortal IT professional. Unfortunately, Microsoft hasn't met this promise with the product's recent release.

Application Center 2000 packs an impressive list of capabilities. The core function of the product is to provide improved reliability and scalability of a site through software-based

clustering and load balancing. The company claims the product makes it relatively easy to manage a set of servers as if they were a single server, which is true. The product makes it relatively painless to initially stage, deploy and continually synchronize diverse sets of components (such as HTML, image and Active Server Pages files, as well as site and server settings) among all the servers in the cluster.

This is one of the strongest features of this product. Once it's running, the clustered Web site benefits greatly from improved reliability and scalability, as demonstrated during our simulated load tests. However, getting to that point isn't easy or without inherent limitations.

Installation of the product was not smooth. Even with application of the required Service Pack, various Post-Service Pack fixes and carefully following the instructions detailed in Microsoft's documentation, it took numerous tries to install the software. With factory-fresh



A Web interface allows network administrators to remotely manage Microsoft Application Center 2000 Web server clusters.

systems, it's unlikely that the typical "try a clean install" advice would make much of a difference. However, after repeated efforts, we got a stable three-system cluster up and running.

Basic management of the cluster is relatively smooth. Application Center 2000 uses the familiar Microsoft Management Console (MMC) snap-in. Management can be performed

from another system using a client installation of the software. A Web-based interface gives administrators real remote access, and a command line interface was available for those looking for raw access for scripting. Interestingly, some important commands appear to be only available via the command line, such as the "clean" command that we issued

See **Review**, page 129





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PSINet,
continued from page 12

enough. That left PSINet as the only national ISP serving business customers that was not owned by a larger, better-heeled telecommunications company. Others say PSINet stretched itself too

thin, starting the venture fund and going on an international ISP buying spree. The company spent nearly \$2 billion on consulting firm Metamore Worldwide and forked over another \$720 million for a credit card processing company called Transaction Network Services (a business PSINet turned around and sold

earlier this month for \$300 million). Though PSINet brought in \$353 million in service revenue during its third quarter, the most recent period for which it has reported results, that was offset by a loss of \$1.4 billion.

"My personal view is that PSINet's network infrastructure is too valuable

of an asset to just go away," says Galaxy's Botkin. "While the company's debt outweighs its worth, I think they will be able to restructure or that another company would come in and buy the network."

Galaxy will order dedicated Internet access from another provider and deploy its own security and monitoring systems when it comes time to make a switch. The company has researched service providers and equipment, but Botkin does not know when it will change its network setup.

"PSINet's financial news is kind of alarming," says another customer, Barney Lejeune, IT manager at Carbo Ceramics, which makes components for the oil and gas industries in Irving, Texas. "I knew they were having some financial problems, but didn't realize how serious it was."

"We're reluctant to jump ship until we see what will happen," Lejeune says. Carbo, nor any of the other users interviewed for this story, have been contacted by PSINet regarding the company's possible bankruptcy.

Carbo is using PSINet's IntraNet managed VPN service to link three of its manufacturing facilities, InterRamp dial-up Internet access for remote users, as well as Web hosting and managed e-mail services. Moving to another provider to support all four services will take much time and energy, which is one reason Carbo is waiting.

Others aren't as patient. Infinetworks, a Naples, Fla., company that was reselling PSINet's InterSky wireless Internet access service, started moving its customers off of PSINet's network last year.

In September, around the time PSINet's third-quarter financials were closing, PSINet notified Infinetworks President Stephen Myers that the ISP was no longer selling InterSky. This wasn't a surprise to Myers, who noted a deterioration in service quality starting as early as February 2000. PSINet promised to support existing InterSky customers, including the 20 Infinetworks served, but Myers started looking for other service options.

"PSINet's service was a great alternative in 1998 because there was a 60- to 90-day waiting period for broadband service from Sprint," the local incumbent carrier in the Naples area, Myers says. "PSINet's technical support was fabulous and the service was affordable at \$200 per month for 128K bit/sec service. But when the service started getting slower and slower, we saw the writing on the wall." ■

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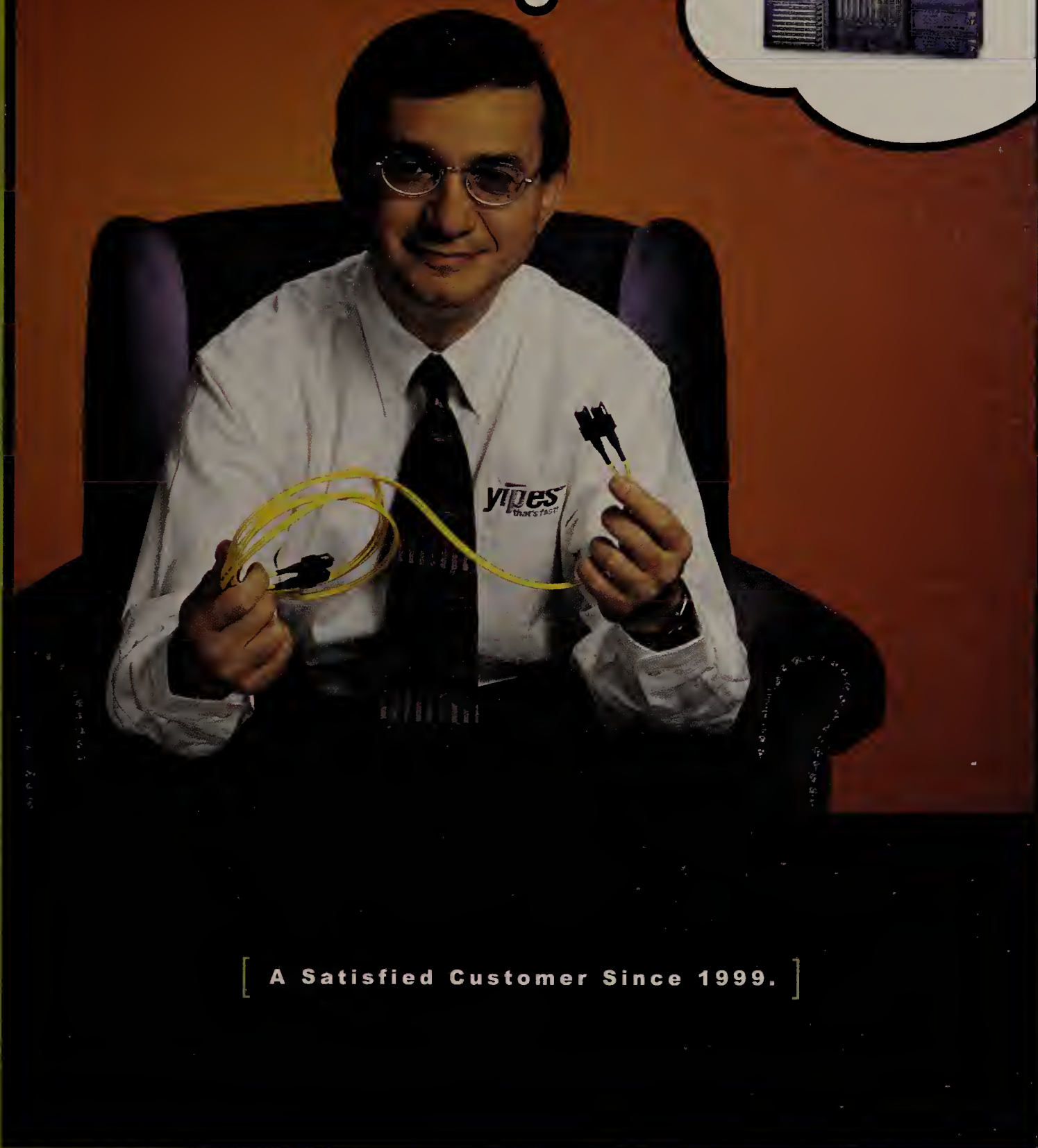
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'Net apps latest casualties of 3Com

BY PHIL HOCHMUTH

SANTA CLARA — 3Com didn't surprise anyone last week with more bad financial results, but it did throw watchers for a loop with plans to dump its consumer 'Net appliance business.

With sales of LAN/WAN infrastructure products, carrier gear and consumer products in decline, 3Com is in major cost-cutting mode, and its Audrey 'Net appliance and Kerbango Internet radio are two of the latest victims. CEO Bruce Claflin says 3Com will continue to restructure to save \$1 billion by the

end of the company's next fiscal year, which ends in June 2002.

3Com blamed the slowing economy in part for its exit from a consumer appliance market it so enthusiastically entered 10 months ago.

"Though we still believe in the potential of the consumer market, the profits aren't there now," a spokeswoman says. "And we don't have time to wait."

3Com's third-quarter revenue of \$630 million fell 18% below second-quarter revenue of \$767 million, while the company racked up a net loss of \$246 million and a pro forma net loss

(which excludes restructuring charges and nonrecurring costs) of \$122.8 million.

The pro forma loss was slightly less than the \$135 million to \$145 million 3Com projected it would lose when it gave a warning about its third quarter financials at the end of February. 3Com had projected making \$725 million to \$750 million in third-quarter revenue before its warning.

3Com got into the consumer Internet appliance market last July when it bought Kerbango, a maker of Internet radio appliances, for about \$80 million. In October, 3Com announced Audrey, a home Internet appliance that resembled a souped-up Palm Pilot with Web browsing and calendar features.

3Com will stop marketing the Audrey and Kerbango appliances by the end of the month, and will stop production of the units by the end of May.

After laying off 1,200 employees in February, 3Com says it will save \$250 million, along with an additional \$250 million by discontinuing its consumer Internet appliance business. The company plans to save another



3Com's Kerbango Internet radio and Audrey home Internet appliance are the latest casualties of the company's tough financial situation.

Foresight aims to ease Web-based B2B trading

BY ELLEN MESSMER

DUBLIN, OHIO — Foresight, a decade-old, privately held firm specializing in EDI software, this week ships software that lets corporations register new trading partners on the Web and exchange business documents in HTML, XML, EDI or other formats.

The server-based Foresight Trade Accelerator keeps track of trading partner activity from first contact, generating an e-mail with a hyperlink back to the Web site encouraging online interaction. When trading partners do register, the Unix or Windows NT program facilitates online exchange of business documents through automated conversion into desired standard formats such as XML or proprietary ones such as those defined by SAP.

Mellon Financial's Global Cash Management division has been using an early version of Trade Accelerator for Web-based document exchange and bill presentment for large companies.

"We offer this as a service we call Mellon TradeLinks on a hosted ASP basis for corporate clients," says Randi Lichtenstein, vice president and senior e-commerce product manager.



Mellon's Randi Lichtenstein is using Foresight's software for Web-based document exchange.

Trade Accelerator provides a lot of flexibility in converting documents for clients, Lichtenstein says.

"We'll be making use of the XML translation eventually, which will simply allow another way to send data," she adds. Mellon encrypts all data it makes available to TradeLinks users via FTP or e-mail by using a separate product, Templar, originally developed by Harbinger, which was bought by Peregrine Systems.

Trade Accelerator, priced according to the number of trading partners using it, starts at \$8,000 for 150 trading partners.

Foresight: www.foresight.com

NorthPoint calling it quits

BY MICHAEL MARTIN

EMERYVILLE, CALIF. — DSL provider NorthPoint Communications last week revealed it has been unable to find long-term financing and will shut down its national DSL network.

AT&T purchased NorthPoint's assets last week for about \$135 million. The deal included NorthPoint's collocation sites, some network equipment, systems and support software, and other assets. AT&T will not keep the NorthPoint network operating.

NorthPoint filed for Chapter 11 bankruptcy protection in January. At that time, company officials hoped the bankruptcy process would buy NorthPoint time to find either financing or a partner to keep the company operating.

NorthPoint has ceased taking new DSL orders and installing lines. The provider says it will work with its ISP reseller partners to transition NorthPoint customers to other DSL networks.

In a letter to customers on its now sparse Web site, NorthPoint CEO Elizabeth Fetter writes: "We urge you to take immediate action to secure alternate services for your needs."

Like other competitive carriers, NorthPoint has been hurt by the lack of available funding in the market.

Last year a negotiated merger between NorthPoint and Verizon fell through after Verizon pulled out of the deal, leaving NorthPoint in a financially precarious situation.

NorthPoint's demise further reduces the options businesses have when looking for a business-class symmetrical DSL (SDSL) line. Covad Communications and Rhythms offer SDSL nationally, while other providers offer the service on a regional basis. ■

'Lion' worm targets Linux

BY ELLEN MESSMER

BETHESDA, MD. — Security experts associated with the SANS Institute have discovered a dangerous computer worm dubbed "Lion" that spreads through Linux computers.

The worm is capable of scanning the Internet to look for Linux computers with the known vulnerability in the BIND Domain Name Server.

After the worm has infected a machine and installed itself, it steals password files and transmits them to the China.com Web site. It also installs other hacking tools, making the machine available for further compromise. Allan Paller, director of the institute, cautions that although the China.com appears to be receiving stolen passwords, the possibility exists that China.com has been com-

promised by someone.

Paller says many Linux computers appear to have not yet installed the upgrade fix for the BIND vulnerability detailed last January. Now, two security experts have identified the computer worm that is believed to have infected thousands of Linux-based servers, with the likely potential it will spread to other versions of Unix.

"The Lion worm is dangerous because in essence it represents a major attack," Paller says. "It takes machines over completely and then begins carrying out the attack on other machines."

A detection and removal toolkit is available at www.sans.org. Information on the BIND DNS vulnerability can be found at www.CERT.org/advisories/CA-2001-02.html.



ON MARCH 12, 2001, two men arrived here from a parallel universe.

Who are they? What do they hope to find?

The men were chosen for their abilities...highly specialized abilities which may prove the salvation of the parallel universe. For their universe is mired in the past...in proprietary systems...in clashing platforms...in stale business practices.

The two men are programmers. Coders. Geeks.

They are the codernauts.

And they are looking for better software.

IT'S A DIFFERENT YOU NEED A DIFFERENT



Log Entry, Day 1: Arrival. We feel the immense responsibility of our mission: to find superior software that will help our universe transform its clashing technology systems into vital e-economies. Hotel has mints on pillow.



Log Entry, Day 2: Hail, open world! We have long sought a place where Linux®, UNIX®, Windows®, OS/390® – indeed, all major operating systems – could work as one. We have found it! It is **WebSphere®** – an e-business software platform based on open standards, such as Java™ and XML. In this atmosphere, any business can become an e-business. This makes the Crab Nebula look like small potatoes.

Log Entry, Day 4: We have detected a multiplatform database somewhere in this building. Our sensors suggest that it can access, manage and analyze all forms of information – even audio and video! We must find this software (known as **DB2®**), which works across UNIX, Linux, Windows and all major platforms, throughout the enterprise and beyond. The alternative: data rot.



KIND *OF* WORLD. KIND *OF* SOFTWARE.



Log Entry, Day 6: People here have the ability to leverage **intellectual capital**! They use "knowledge management" software to catalog employee expertise. Other employees can then locate and capitalize on valuable existing knowledge, rather than laboriously recreating it. This **Lotus**® software promotes collaboration far more effectively than our "Finger of Knowledge" technique.



Log Entry, Day 8: We have encountered a treasure trove of portable information! In this universe, people can access pertinent corporate data from any location in real time – on a PDA or cell phone! The software facilitator is called **DB2 Everyplace**™. We have appropriated same and signed up for 257.1 million user licenses.



Log Entry, Day 14:

Today we committed ourselves to research. In so doing, we discovered that **WebSphere** is chosen by more CIOs than any other e-business software platform. Why? Its ability to leverage legacy systems? To work across 35 platforms? Is it the tools, the ease of deployment, the e-commerce capabilities? To the men and women CIOs of this realm, we say to you: we do not take your word lightly. We will find out.



Log Entry, Day 7:

Infrastructure: From the roads and bridges of this society to its hidden software, it is vital. Here, the technology infrastructure is managed by **Tivoli**® software. If we'd had such integrated yet flexible technology management software in the parallel universe, the whole Tiborg-7 incident might have been avoided.



Log Entry, Day 10:

Security is just as important here as in the parallel universe. But here, security goes by the name **Tivoli**. This Tivoli software protects networks – indeed, entire e-businesses – from outside hackers as well as unauthorized personnel. This one goes in the space pack.

Log Entry, Day 11: This knowledge worker is learning about a new **product**. His cranial surface reveals that this information has been simultaneously dispersed to other sales reps, business partners, the marketing department and customer service – team members all, marching to market in a coordinated phalanx. This is called e-learning. With **Lotus** software for e-learning, our universe will have a decided competitive advantage.

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WebSphere, Lotus, Tivoli, DB2 - these were names the codernauts would remember. This was powerful e-business software - and it was all linked by one entity: IBM.

But there was still much to learn. E-marketplaces, supply chains, Web services - in this universe, software was transforming business. Data was gaining a new life online.



**Download the codernauts!
Go to ibm.com/software/visitors**

Watch as the codernauts encounter multiple corporate types in their quest to save the parallel universe from the dreaded threat of incompatible legacy systems and unfriendly source code.

The codernauts decided to contact more alpha geeks. (One had pointed them to a Web site called developerWorks™, which had free Java and XML tools and code; critical, since the future of the parallel universe relied on open standards.)

They also meant to explore every chat room, poke into every software lab, and meet every Business Partner (the friends of IBM were many and far-flung), until they had uncovered all of this world's best software.

THE MISSION CONTINUES.

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Novell boosts storage and management offerings

Company previews network-attached storage device, management software upgrade at BrainShare show.

BY DENI CONNOR

SALT LAKE CITY — Novell bolstered its directory-enabled applications last week with a slew of new products and features designed to make it easier for net managers to solve file and print, remote access and management problems on their NetWare, Windows NT/2000, Solaris and Linux networks.

At its annual BrainShare customer conference, the company announced a network-attached

storage (NAS) product, improvements to its ZENworks for Server and Desktop management products, and Internet printing. In addition, company executives updated users with news of shipment dates for GroupWise 6 and NetWare 6 Enterprise Edition.

Novell will ship a NAS product for workgroups, departments and branch offices this summer that works with NetWare, NT/Win 2000, Unix, Linux and Macintosh files. It will compete with NAS devices

from Maxtor, Dell and Compaq. Most NAS appliances don't work with Novell's file system and few vendors have plans to support it. For NetWare 3 and 4 users, NAS represents a potential replacement for file and print services.

Novell also announced that its server clustering software for NetWare 5 now works with EMC's TimeFinder and Symmetric Data Replication Facility. Sources say a version of EMC's PowerPath that will work with NetWare is in the offing. PowerPath provides load-balancing and failover capability for servers connected to EMC Symmetrix storage arrays.

An informal survey of Novell users during an EMC/NetWare briefing at BrainShare showed that 50% of NetWare users have Symmetrix storage.

The company also introduced a product called Novell Internet Printing that lets a user

Novell's NAS appliance

The midrange appliance works with NetWare Core Protocol (NCP) files, as well as with Windows NT/2000, Solaris, Linux and Macintosh file systems. Features include:

- 300G bytes to one terabyte of storage
- NDS eDirectory integrated
- Managed from ZENworks for Servers
- Software-upgradable
- Rack-mounted
- Support for CIFS, NFS, NCP, AFP, HTTP, WebDAV

print to any of his company's printers over the Internet, regardless of location. For instance, users working from home or a remote office can send print jobs to headquarters for their manager's perusal. Novell Internet Printing will be available for any customer that has at least one NetWare 5.1 server with Support Pack 2 or higher.

Novell also detailed its road

map for ZENworks for Desktops and Servers.

It will ship a version of ZENworks for Servers later this year that will allow management of NT and Solaris policies as well as use on Windows-only networks. ZENworks for Desktops will also be enhanced to include support for PDAs.

Finally, Novell announced that its Single Sign-On product now works on Solaris and Linux networks, as well as NetWare and NT/Win 2000. Single Sign-On is a directory-enabled password management system that lets users only enter their passwords once for access to any desktop or Internet application. ■

Novell preps storage for users on the go. Page 35.

Novell,
continued from page 9

tect engineer for Capital Regional Healthcare in Concord, N.H., says he is excited about Novell's focus on products and consulting services because Novell's consultants are experts in the healthcare area.

"Once people try to implement [the Health Insurance Portability Accountability Act] without a directory, they find they'll need one," Starry says. HIPAA spells out what hospitals, insurance companies and the government must do to ensure the security and privacy of patient data. "Hospitals understand the need for directories and Novell Consulting understands HIPAA. With HIPAA coming, the directory is going to be key to our network," Starry says.

Users say one problem Novell needs to solve is the expense of consulting services. Engaging Novell Consulting costs as much as \$15,000 per week or \$400 per hour. Even for a company like Starry's, which spends 35% of its capital budget on information services, that's an expense it can't casually assume.

"Novell needs to slash prices or get a gimmick," Starry says. "They make it so intimidating for people in the amount of up-front money cus-

tomers have to pay without really knowing what they are going to get."

As an example, Lionberger says Novell's original proposal for implementing iChain was about \$750,000.

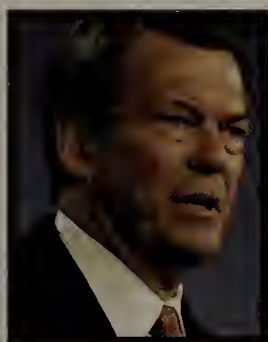
"This would be an impossible sell to executive management," he says. "Novell needs to package the product based on initial need and assist with the return-on-investment model."

Users also would like to see Novell refocus some of its resources.

"I'd like Novell to say NetWare is not an application platform and redirect those developers to even better solutions, such as OnDemand Services or iFolder," Starry says. "Novell needs to focus more on Java-based directory applications rather than the Java Virtual Machine in NetWare."

Overall, though, optimism remains high.

"Novell is probably the only company in the industry that if they were bought up, their technologies would still be around," says Ron Brown, director of information security for Freddie Mac in Washington, D.C. "Look at [Novell's] installed base. Someone will still need to support that infrastructure." ■



Incoming CEO Jack Messman describes Novell's software as "compelling."

VoIP,
continued from page 14

phone features from a PC interface.

Other voice-over-IP services will take advantage of VoiceXML, a version of XML that lets users do things such as access Web pages by talking into phones. IPeria last week added VoiceXML capabilities to its ActiveEdge application server, which acts as an enhanced Class 5 telephone company switch for providing basic voice-over-IP call services to customers.

TalkingNets, a Wilmington, N.C., voice application service provider (ASP), is testing the IPeria software. The ASP offers IP Centrex-like services that include policy-based call management, unified messaging and find me/follow me. The services cost between \$25 and \$35 per month per user.

"The whole world is being outsourced," says Brian Strachman, an analyst with Cahners In-Stat Group. However, he believes IP Centrex will succeed only in smaller businesses because if a company has the capacity to buy, install and maintain its own phones and

other telephony gear, that's probably less expensive in the long run.

"I wouldn't count on any big installs for IP Centrex for a while," he says.

Peter Young, a network administrator with the Rockford Public School District in Michigan, says he never considered outsourcing the district's phone system. Rather, recently he installed a 600-seat 3Com NBX LAN telephony system and IP phones to support all the administrative offices and classrooms throughout his district.

Young says he and his staff wanted to have control over the phone switching equipment they have on the premises, just as they did with their legacy Nortel PBX. Overall, Young says, his school district saved around \$500,000 by going with IP voice instead of buying a new PBX. ■

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IBM drops 'Blue Hammer' on clustering market

BY KATHLEEN OHLSON

ARMONK, N.Y. — As part of its continuing effort to bring Linux into the mainstream, IBM last week introduced technology that will let businesses maintain huge Linux or Unix server farms from a single location.

In December, IBM pledged to spend \$1 billion this year for Linux development across its product lines, including PCs, mainframes and servers. IBM says the operating system will be instrumental for business applications and a viable alter-

native to Windows NT/2000.

Code-named "Blue Hammer," the clustering technology can be used for applications ranging from Web serving to back-end enterprise resource planning (ERP) and customer relationship management (CRM).

IBM is targeting the clusters at biotech companies, ISPs, application service providers and companies with Internet data centers.

Mediaprise plans to implement the Linux and AIX versions of the clusters to simplify

its database server and Web environments at its Austin, Texas, hosting center, says Pat Bowman, director of technology operations at the hosting service provider. "There'll be an increase of speeds and feeds for more throughput," he says.

DaimlerChrysler plans to consolidate its servers with an AIX cluster in the spring. "I'll gain back some real estate in the data center," says Mike Kasperek, the company's team leader of AIX support. "I'll have room to grow again."

The clusters are built using

IBM's system management software, known as Parallel System Support Programs (PSSP), and the file system, called General Parallel File System (GPFS), which are used in its SP supercomputer. The software runs on a central workstation, which in turn balances workloads among all servers in the cluster to which it is connected over a high-speed LAN.

PSSP lets users manage multiple servers — up to hundreds in some businesses — per cluster. The clustering technology supports administrative functions, such as operating system installation and configuration.

GPFS enables shared file access across servers in a cluster, and scales to 9 terabytes.

The Unix version clusters up to 32 two- to eight-way IBM M80 machines or one- to six-way IBM H80 servers running AIX, IBM's version of Unix. Both midrange servers, M80 and H80, can be clustered with IBM eServer p680 or S80 servers. The M80, H80, S80 and p680 systems can also directly attach to an SP supercomputer. The Linux version clusters up to 32 two-way IBM eServer x330 Intel-based machines. IBM plans to scale the clusters up to 256 machines in the future.

Stacy Quandt, an analyst at Giga Information Group, says IBM's clusters will improve performance for applications such as ERP and CRM. She also expects IBM to roll out hybrid Unix-Linux down the road.

Quandt adds that IBM is ahead of its competition — Compaq, Dell and Hewlett-Packard — in supporting high-end clustering in Linux-powered, Intel-based servers. The company is also more aggressive in exploring clustering in Unix-powered Intel-based servers, she says, compared to HP, Compaq and Sun.

The AIX clusters will be released this week for \$32,000 per node. Linux clusters will be available in June, but pricing hasn't been set. ■

Sun packs mainframe features into servers

But some key features, such as dynamic partitioning, not ready at outset.

BY KATHLEEN OHLSON

NEW YORK — Sun last week unveiled midrange servers designed to give businesses more redundant and flexible — yet less-expensive — machines than those from rivals IBM and Hewlett-Packard.

Sun, which Dataquest says eked past reigning leader IBM with \$4.8 billion in server sales last year, is vying to expand its market reach with four new Solaris servers powered by the company's 64-bit UltraSparc III processor.

Company officials claim the new 3800, 4800, 4810 and 6800 Sun Fire servers — which start at \$73,200 — are the first midrange Unix boxes that support features originally found only in mainframes, including Sun's own E10000 system.

A key feature is the Fireplane interconnection that allows a server to be partitioned to handle different applications. Partitioning allows companies to test software or fix a broken component on one part of a server without disrupting the rest of it.

The Fire servers, which Sun expects will appeal to data center hosters and companies running back-end data warehouses, also offer hot-swappable CPUs, I/O memory upgrades and concurrent maintenance while the system and applications are running.

Although the Fire servers are shipping, there is a hitch. According to Sun's Web site, features such as hot-swappable CPUs and dynamic partitioning won't be available until later

after its initial announcement five months ago. Still, analysts say Sun is at least six months ahead in hardware capability for midrange servers.

"They've got a good lead on

Sun sets fire to server market

The new Sun Fire servers feature:

- Redundant hardware components to eliminate single points of failure.
- Ability to scale from two to 24 processors.
- Support for Solaris 8.
- Sun Management Center, a Web-based management tool.



Sun Fire 4800

this year.

Even so, analysts are bullish about Sun's ability to deliver mainframe-like features on midrange systems.

"They've brought the best features [such as hot-swapping CPUs and I/O redundancy] in the high end and brought them down to a lower-end machine at a [better] price performance," says Joyce Beckwell, an analyst at Aberdeen Group. "No one else can do that now."

But that doesn't mean IBM or HP won't try to match Sun. IBM is readying an enhanced midrange server line called Regatta, and HP just started shipping its high-end Unix Superdome server in volume

[IBM and HP], and I don't see anybody on the Wintel side" adding such high-end capabilities to their midrange line anytime soon, says Brad Day, an analyst at Giga Information Group.

Hosting service provider Digex, in Laurel, Md., will add Fire servers to its Sun lineup, which includes the E10000, to house mission-critical applications, says Charles Boyle, the company's co-founder and director of research and development. "These things can never fail, and we'll be able to service [the servers] on the fly" without disassembling them, he says.

Sun: www.sun.com/servers/midrange/

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FOUNDRY
NETWORKS

IETF,
continued from page 9

month. "There are some signs that Walid may change its [intellectual property] stance," Blanchet says. "But there is no chance that the IETF will move ahead and test this patent claim."

Walid competitors likely to test the claim include I-DNS.net and VeriSign, which is running a multilingual test bed in partnership with Walid.

Back-up plans

If Walid doesn't agree to free and open licensing, the IDN working group is prepared to move forward with one of two technical alternatives:

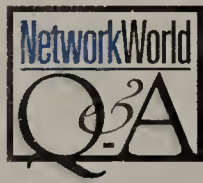
- Running the Uniform Transformation Format (UTF) — a Unicode representation — straight over the Internet, which would be confusing for end users and require revamping many protocols, including the Simple Mail Transfer Protocol and SNMP.

- Creating a directory service on top of DNS to handle name translation and provide context for complex languages. The drawback of this solution, which Klensin proposed, is that it will take much longer to develop, debug and deploy than alternatives.

"I firmly agree with the way the IETF deals with [intellectual property] claims," says Paul Hoffman, co-author of the internationalization approach now patented by Walid.

But if Walid doesn't back off on its licensing claims, "it will be a very bad problem for everyone. We can either not do internationalized domain names, which will hurt end users because bad, proprietary solutions will exist, or we can go with UTF on the wire, which will also hurt end users." ■

New head of IETF facing a full plate



Network
World
Senior Editor
Carolyn
Duffy

Marsan sat down last week with the IETF's new chair, Harald Alvestrand, to discuss his plans for the group's future. Here's an excerpt from their conversation:

How will the IETF change under your leadership?

My job is to facilitate the change that has to happen. We have to get a better feel for managing our relationships with other standards organizations. We have to get protocol documents out on time, and we have to make sure that they're finalized. We have to do a better job of resolving conflicts and



STEVE WOLT

not letting them stew. But I see no need to change the basic structure of the IETF.

The one criticism about the IETF is that the group takes too long to develop standards that the market needs. Some say that might cause the IETF to become irrelevant.

Many companies come to

us and would like us to standardize something they've developed. We look at it and find that it's broken here, it won't scale and it isn't secure. Being right takes some amount of time. Companies should know that it takes a serious investment in time to get the work done.

How will the IETF's mix of work change in the future?

It won't. We do everything from what runs on the wire to the applications. It's a matter of getting the Internet to work.

What do you consider to be the IETF's most significant work?

That's a difficult question. IPv6 [the next generation of the Internet's main communications protocol] is significant because it alters the possible

scale of the Internet. But it is probably several years before IPv6 will be widely deployed. Two other big issues are mobility and security. Mobile communications are already changing the culture, and they're going to change the Internet. We have to consider what it means to have connectivity with security that allows all functions to reach you wherever you are.

You also co-chair the Domain Name Supporting Organization within the Internet Corporation for Assigned Names and Numbers. What's your view of ICANN?

The Internet needs certain things done that smack of regulation, like keeping track of domain names and adding new top-level domains. We at the IETF are definitely not good at regulation. However, ICANN is not good at it either. The biggest problem I have with ICANN is the lack of logic behind what it does. But the bad thing is that I don't know how ICANN could do its job any better.

How will the IETF's relationship with ICANN change under your leadership?

I would like to see at least the [Internet Assigned Numbers Authority] function being identified as a separate thing, something clearly controlled by the IETF and the IETF only.

What do you think of New.net, a start-up that recently announced plans to sell names using 20 top-level domains that were not approved by ICANN?

What I think of New.net is not fit for print. Identifiers on the Internet need to be unique and verifiable. When two people create the same name and pass it around to a third person, that third person is in deep trouble. Of the 20 domains that New.net is selling, 18 are already operational with other alternate domain name providers. These companies believe new [top-level domains] can be created by thinking of them first. That idea neither has forethought, nor fairness, nor quality control. ■

Even the IETF is feeling the downturn

BY CAROLYN DUFFY
MARSAN

MINNEAPOLIS — The Internet Engineering Task Force enters the post-Internet-bubble era with a new leader, an evolving set of protocol development projects and a shrinking pool of attendees. These shifts in the Internet's premier standards-setting body were evident at a meeting here last week.

Harald Alvestrand, a Cisco Systems engineer and a longtime IETF participant, has officially taken the reins of the IETF. A Norwegian, Alvestrand is the first non-American to hold the volunteer post. He replaces another Cisco engineer, Fred Baker, who held the IETF chair position for the past five years.

Alvestrand will lead the IETF at an interesting point in the group's 15-year history. Once a close-knit community of American academics, the IETF is now an international body representing the world's leading network equipment, software and telecommunications companies.

In recent years, the IETF has become a victim of its own suc-

cess. Meetings have attracted too many participants, which slowed down the consensus-building process that is the group's hallmark.

At the same time, the group's workload swelled as corporate users demanded open, Internet-based protocols for emerging network applications and technologies.

Participation at the IETF's meetings, which are held three times a year, peaked at 3,000 during a December 2000 con-fab in San Diego. This week's meeting, which is being held in a colder climate, attracted 2,000 attendees.

Blame the economy

Many IETF participants believe the drop in attendance is caused by the financial woes of leading Internet vendors. The companies that employ the largest number of IETF participants — Cisco, Nortel Networks, Lucent, AT&T and WorldCom — are suffering from lowered earnings, sliding stock prices and layoffs.

"The attendance decline is definitely due to cutbacks in corporate travel," Alvestrand

says. "I know for sure that it was harder for people from Cisco Europe to tell their managers that they had to go to the IETF meeting."

However, Alvestrand says fewer attendees may be a good thing, as the group was getting too big to function well. "When there are 200 people in the room, some people don't feel as good about speaking up," Alvestrand says.

Indeed, IETF leaders are confident that their companies will continue to invest time and money in the group's work, regardless of how bad the overall economic situation gets.

"The layoffs are in manufacturing and support jobs for products currently being sold," says John Klensin, head of the IETF's Internet Architecture Board and an AT&T executive. "If companies start laying off people that are developing what they'll be selling tomorrow, that would be suicide. If I gave out stock market advice — which I don't — I'd look for companies still investing in Internet development." ■

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News

CA finds mobile mgmt. partners

The company extends its network mgmt. software to wireless.

BY DENISE DUBIE

HANNOVER, GERMANY — Computer Associates last week announced several partnerships with mobile industry pioneers that the company says will give customers options to manage their wired networks and new wireless devices with the same tools.

CA announced the partnerships at the CeBit conference in Hannover, Germany. It is teaming with Aether Systems, Motorola, Nokia, Symbol Technologies, Soft Design and EDS. CA did not

make corporate data accessible to mobile users. Under another agreement, EDS will use CA's Unicenter TNG in an outsourced model.

The teaming of CA and Soft Design will let users build WAP and iMode applications to be used in field situations, as Kurt Nielson is doing at Scandinavian Garment Services (SGS) in Denmark.

SGS uses CA's Cool:Plex software with Soft Design's Websyidian application to let truck drivers use WAP-enabled phones to report inventory coming in and going out in real time. Nielson, IT director at SGS, says using CA to let mobile users tap into the corporate network saves the company "a lot of kronas." SGS has been a CA customer for about six years, but just in the past six months began using the integrated WAP-enabled phones.

"Using the mobile phones, our drivers can scan the goods when they are coming in and when they are leaving from the SGS terminals," he says. "It really reduces our costs because it's much cheaper to buy a lot of WAP phones than a lot of PCs." He also says the training involved with WAP phones takes about five hours, whereas training the drivers on laptops became too time-consuming.

CA is ahead of competitors such as BMC Systems, Hewlett-Packard OpenView and Tivoli "in terms of creating a unified marketing push around wireless," says Jasmine Noel, an analyst with Hurwitz Group. "In terms of actual management capabilities, I don't see that much difference.

"[Its] partners bring a lot of device management capabilities," she says. "What CA brings to the picture is wireless management under a single enterprise infrastructure management umbrella."

Bob Lonadier, a Hurwitz analyst, says CA's partnerships could be significant in furthering the adoption of wireless technology in the U.S. CA stands out from competitors in the net management market by offering many ways to manage wireless networks, and differentiates itself in the wireless market with more proven software expertise than vendors such as 724 Solutions or F-Secure.

"The barriers for wireless adoption [at least in the U.S.] have not been lack of infrastructure management but the lack of applications," Lonadier says. "To the extent that CA's partner announcements can help promote application development, this will encourage adoption of wireless applications and therefore CA's management infrastructure."

The fruits of CA's new partnerships are available immediately.

CA: www.ca.com



Kurt Nielson, director of IT at SGS, says CA's partnership with Soft Design lets his company use WAP phones to track inventory delivery and shipping in real time.

announce new software products, although the company indicates it will make more wireless announcements this year. CA will integrate its existing software products with wireless offerings from its partners.

CA and Aether combined Unicenter TNG with Aether's ScoutIT Server to manage wireless devices. Unicenter's management features will be extended to the wireless devices connected to the corporate network via the ScoutIT Server. Unicenter TNG customers also can now integrate Motorola Wireless Application Protocol servers into their enterprise networks and extend the Unicenter network management capabilities to WAP-enabled wireless devices. In similar fashion, Unicenter will work with Nokia's 9210 Communicator devices and its Activ Server to perform remote management from WAP devices.

CA will use Symbol Technologies' wireless LAN and mobile computing devices to extend its Unicenter technology beyond the connected network. This partnership will offer centralized management from a single console and

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E-business specification passes a key milestone

BY JOHN COX

LONDON — Nearly a dozen companies joined last week to demonstrate

how key parts of the emerging ebXML standard eventually will smooth electronic business transactions.

The ebXML specification — which

will be supported in assorted e-commerce software packages — is designed to create a standard XML dialect that will let businesses find

each other on the Internet, form trading partner agreements and exchange business documents electronically.

But one element still missing from ebXML is the Simple Object Access Protocol (SOAP), which was developed by Microsoft and others, and finally gained acceptance by the ebXML partners in February. SOAP, at its simplest, uses XML and HTTP to let one software component identify and activate others on remote servers.

SOAP's acceptance came too late to include the technology as part of last week's demonstration, says Ralph Berwanger, an executive with bTrade.com and a member of the ebXML Transport, Routing and Packaging group. When SOAP 1.1 is included with ebXML, developers will be able to use SOAP or existing ebXML equivalents, he says.

The ebXML group plans to have a final version of the e-business specification at its May meeting, and SOAP will be fully integrated at that time, according to Berwanger. "We'll show a fully functional message service handler, with SOAP and security components in place."

In the demonstration, held at the XML One conference, companies could register as members of a fictional trading community, and automatically identify and find applications or services offered by others. Then they created collaboration agreements and exchanged shipping notices, receipts and other documents.

"What ebXML says is, 'I don't care what your internal processes and data structures are: I can carry any kind of [message] — XML, X12 [an EDI standard], EDIFACT, or a proprietary container,'" Berwanger says. "It lets you move between different [electronic business] syntaxes and include new trading communities that [in the past] couldn't afford the infrastructure costs of participation."

Previous ebXML demonstrations, late last year, could only show part of the now nearly complete ebXML infrastructure.

The ebXML initiative is jointly sponsored by a United Nations agency charged with global policy and technical development, and Oasis, which is a nonprofit consortium promoting XML standards. Companies backing ebXML include BEA Systems, Bowstreet, Commerce One, IBM, Sun and others. ■

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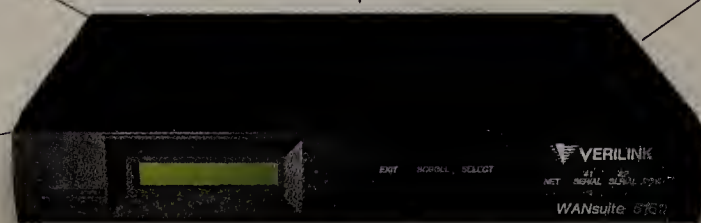
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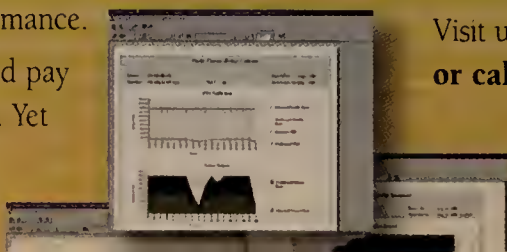
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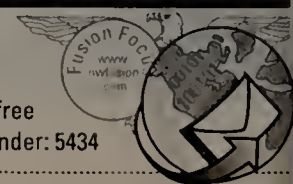
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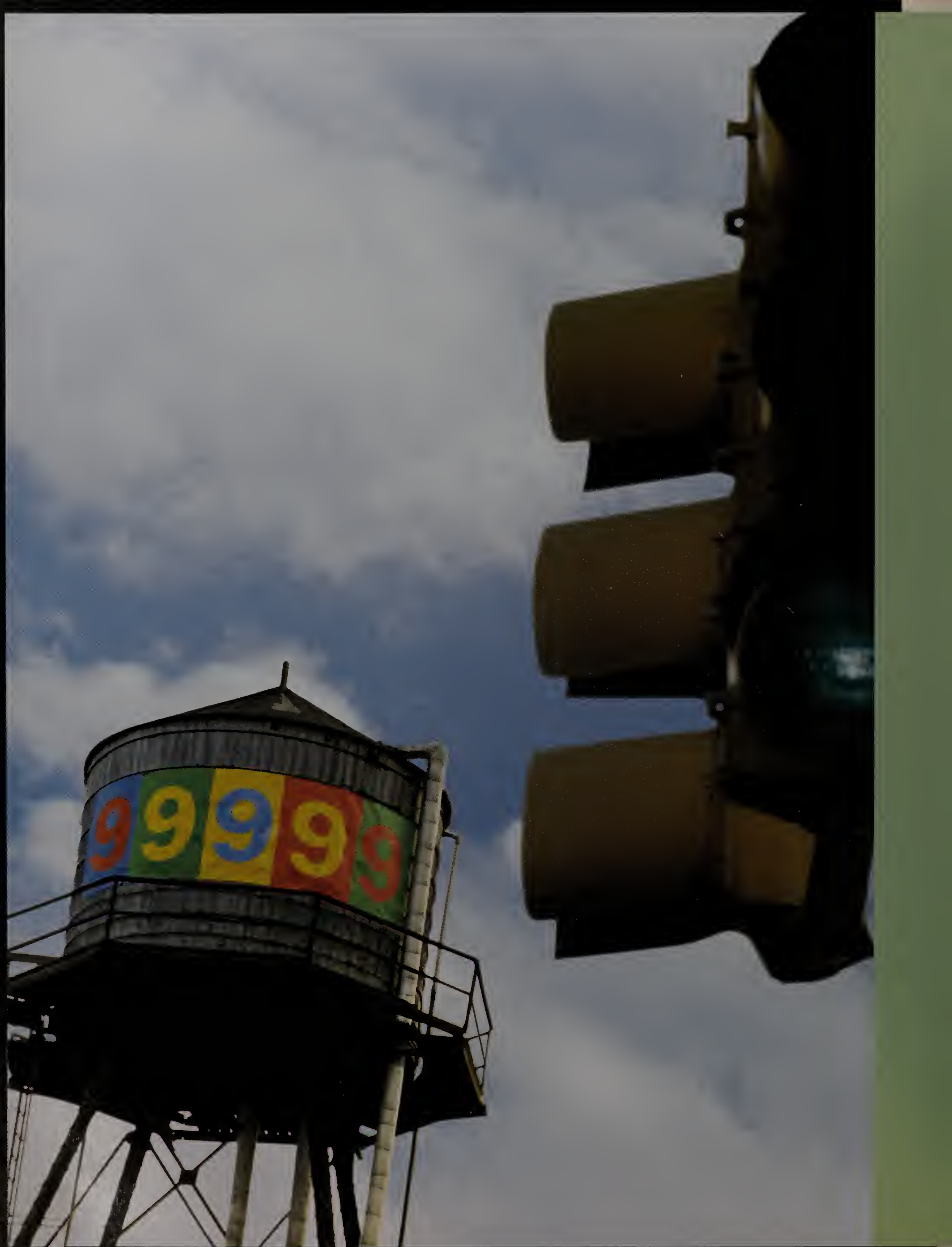




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Of course, a server OS alone doesn't get you five nines, which is why we've teamed up with industry-leading system providers to ensure that the right combinations of people, process and technology are utilized. Today Starbucks, FreeMarkets and MortgageRamp, an affiliate of GMAC Commercial Mortgage, are using Windows 2000 Server-based systems designed to deliver 99.999% service availability. Obviously, not all installations are required to perform at this level, but one thing is for sure: The Windows 2000 Server family is the most reliable set of server operating systems Microsoft has ever produced.





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solutions for line-of-business applications, dot-coms and hosts (ASPs & ISPs). And with support for 4-node clustering, it can dynamically scale out as your needs demand it. Windows 2000 Datacenter Server maximizes uptime through system architecture improvements, along with fault-tolerant and redundant system services.

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Of course, achieving 99.999% reliability is not just a function of deploying a rock-solid server OS, but also requires the right combination of people, process and technology. Which is why we have teamed up with industry-leading system providers to create the Windows Datacenter Program and the stringent Datacenter Hardware Compatibility Test. These programs ensure that systems are certified and that you have 24 x 7 access to specifically trained support professionals. Plus you get the choice of working with 14 Intel®-based high-end OEM system suppliers offering best-of-breed solutions. What's more, Windows 2000 Datacenter Server gives organizations a powerful and scalable alternative to more expensive proprietary solutions.





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Microsoft



Infrastructure

TCP/IP, LAN/WAN Switches, Routers, Hubs, Access Devices, Clients, Servers, Operating Systems, VPNs, Networked Storage

Briefs

Storage vendor Veritas has announced a new version of its back-up and recovery software for NetWare. Backup Exec for NetWare 9.0 includes a new user interface and wizards that let network managers create, delete and modify schedules, and create pools of information that will be backed up.

The software features a new Java-based client for managing the back-up process; Windows NT-like back-up functionality; the ability to back up the network from a specific network adapter and reroute traffic off the network; and support for larger blocks of data used with newer tape drives.

Backup Exec for NetWare will be available this summer for \$800 per server. Agent packs to back up NT, Windows 2000 or NetWare remote servers start at \$250.

Veritas: www.veritas.com

IBM said last week it would make its storage products Linux-compatible. IBM's Shark enterprise storage servers can now connect to IBM S/390 mainframes or eServer z900 servers running Linux.

Linux support will be available in June for FastT200 and FastT500 disk storage servers connected to Intel-based servers. Ultrium linear tape open drives and Magstar 3590 tape products will support Linux for tape backup later this year, the company says.

IBM's Tivoli Systems subsidiary will offer Linux-enabled storage management software: Tivoli Storage Manager, Tivoli SANergy and Tivoli Storage Network Manager. Justifying its latest Linux effort, IBM cited IDC research that describes Linux as the fastest-growing operating system among storage customers, estimated at a 35% compound annual growth rate through 2004.

IBM: www.ibm.com

Novell storage aimed at users on the go

Company's iFolder software designed to let users log on and store files from anywhere.

BY DENI CONNOR

Novell last week introduced software designed to let users access and store files regardless of where they log on from — an offering observers say is a good example of software that takes advantage of existing network directories.

Novell's software — code-named iFolder Storage Services — enables users whose computers are outfitted with a Web browser or special client software to retrieve and store files on servers residing on corporate networks or in service provider data centers. Network directories authenticate users and grant them access to files.

New Novell products such as iFolder “exploit the directory,” says Neil McDonald, an analyst with Gartner Group. “People don't care about directories — they care about what you can do with the directory. That's where Novell is finally coming to market with products that solve business problems.”

The primary piece of iFolder sits on a NetWare server running Apache Web server or a Windows NT or 2000 server running Microsoft's Internet Information Server. A client component runs on Windows machines and works with popular Web browsers.

When an iFolder user creates a file in the C drive My Documents folder on his machine, the file is copied to an iFolder server over whatever communications link is being used, possibly the Internet. To conserve bandwidth usage and reduce latency, modifications to files can be copied to the server without the entire file being transferred. In this respect, iFolder is more efficient at handling files than competing products such as Microsoft's Intellimirror, observers say.

Each iFolder transaction is sent and stored in an encrypted fashion. iFolder lets users decide if they want to share files with others. The software works with Novell's NDS eDirectory and any Lightweight Directory Access Protocol-enabled directory to provide access and user authentication.

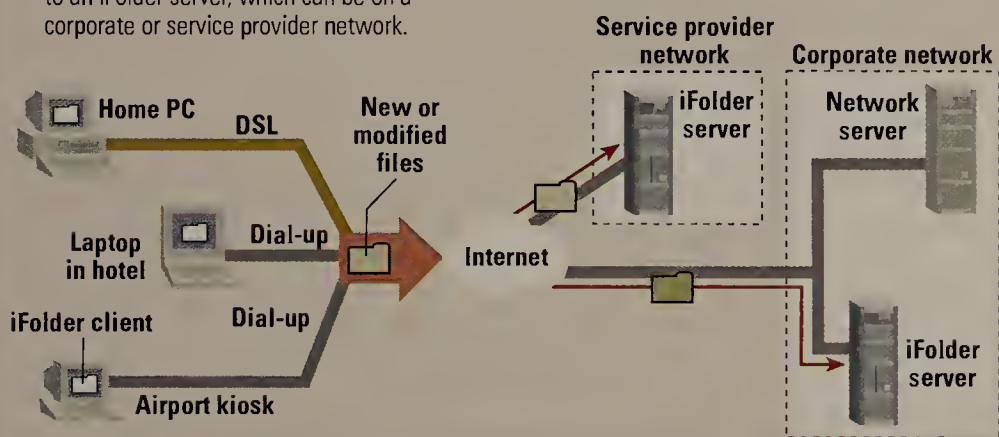
Michael McKenney, IS manager for Americorp Financial in Birmingham, Mich., says the technology could be a boon to traveling salespeople. With more hotels and remote offices using DSL and other such broadband connections, he says, “Users could go back to the hotel

Novell's iFolder Storage Services

iFolder provides users with access to their files from any location and any PC device.

1 Users whose computers are outfitted with a Web browser or iFolder client log on to an iFolder server, which can be on a corporate or service provider network.

2 Files users have created or modified on their laptop or desktop PCs are transferred to the iFolder server. Users can also retrieve files.



and connect to the DSL and back up.”

iFolder will be sold on a stand-alone basis, included as part of the next version of NetWare 6 and delivered as part of service

provider offerings.

Pricing is not available for the product, which is slated to ship this summer. Novell: www.novell.com

New box unites DSL modem, router

BY PHIL HOCHMUTH

BOTHELL, WASH. — Allied Telesyn last week announced aggressively priced routers to give home-office or small corporate branch-office users Internet and VPN access.

The AR240 and AR250 asynchronous DSL routers — priced \$100 less than competing 3Com products and about the same as rival Cisco gear — combine the functions of ADSL modems and routers, thereby eliminating the need to deploy separate boxes.

The AR250 is a single-port ADSL router aimed at small offices and includes a four-port 10/100M bit/sec Ethernet switch and one Universal Serial Bus (USB) port. The AR240, aimed at home users, comes with an ADSL connection, a USB port and one 10M bit/sec Ethernet port.

Both routers support Layer 2 VPNs using Microsoft's point-to-point tunneling protocol for securing WAN connections across the Internet. The routers provide firewall capabilities through network address translation.

Analysts say the popularity of small routers will grow as more small businesses get on the Internet. According to market research firm IDC, the worldwide market for small-office and home-office routers will grow steadily from 1.21 billion this year to 1.55 billion in 2003.

The AR250 and AR240 are available now and cost \$500 and \$420, respectively. Allied: www.alliedtelesyn.com

www.nwfusion.com

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Videoconferencing system integrates PC data

PictureTel's iPower 960 delivers outstanding audio and video and stacks up well against appliances.

BY CHRISTINE PEREY,
NETWORK WORLD
GLOBAL TEST
ALLIANCE

Proprietary appliance architectures make sense when you want to tightly integrate many complex systems. When developers of a proprietary videoconferencing appliance use standard communications protocols, such as H.320 and H.323, their products interoperate with any standard-compliant device.

But when you want to collaborate and exchange PC data during a videoconference, sticking with a native PC platform reduces your headaches and improves user productivity.

PictureTel's newest product is designed for people who need lifelike video and crystal-clear audio, as well as graphics or text that appear crisp, readable and can be modified by videoconference participants. Developed in collaboration with Intel, the iPower 960 is an ISDN- and IP-compatible solution for a meeting-room setting.

We put the iPower 960 in our lab and assessed audio and video quality, interoperability, end-user experience and collaborative features (see How we did it, www.nwfusion.com, DocFinder: 3423). The iPower 960's packaging is well-thought-out and offers high-quality audio and video, and thus wins a World Class Award.

Performance and features

The paramount concerns with videoconferencing are audio fidelity and clarity, and video quality (frame rate and image resolution). The goal is to make users feel like they are in the same room. The audio and video quality depend on the technology in the endpoints and the networks that connect them.

That said, the iPower does everything technologically possible to make up for unfavorable network conditions. In our tests, the product delivered echo-free, full-duplex audio.

We subjected our test conferences to optimal and poor network conditions (for example, congestion on the Internet and irregularities in ISDN service). At 384K bit/sec, we found video frame rates consistently greater than 20 frames per second with few perceptible artifacts (blurred edges, miscolored pixels or blocks of pixels), even under low light conditions.

Let's collaborate

The iPower 960's prime selling point is PictureTel's People+Content technology for productivity-enhancing applications and seamless system functionality. For presentations and document sharing from PC to PC, the product has Microsoft's NetMeeting 3.01 built in, although the NetMeeting interface is hidden. Consequently, it's

friendlier than NetMeeting. When a connection can support a T.120 data conference, an icon appears in the lower right corner of the screen. After a few simple dialog boxes, you can share any local or server-based file with the people in your conference.

Furthermore, the iPower integrates heterogeneous input — from laptops, paper documents, Web content and whiteboards — with video in a way that automatically alters the data processing to fit the type of information being transferred. This is done through a specially designed interface called ImageShare and software in the PC.

In contrast with conferencing systems that use National Television Standard Code displays for output of PC applications (such as an Excel spreadsheet or PowerPoint presentation), the iPower 960's input-device sensitivity lets participants see content clearly. The iPower 960 detected when the content was not video from the camera source, and therefore encoded directly to VGA, SVGA and XGA computer resolutions using the H.263 "custom picture format" facility. Using H.263 to encode XGA provides significantly faster display speeds than T.120 data conferencing.

User interface

The iPower 960's main graphical user interface hasn't changed dramatically from the look and feel of the PictureTel TeamStation (the company's previous PC-based product), and it remains attractive. The fonts are bright and large enough to have instructions and text be seen across the room while you are entering numbers on the screen or selecting different options. This is the case until you hit an error, when the fonts are so small that you must get up close to read the text.

The handheld remote control's design is intuitive (it matches what's on the screen), and the wireless keyboard/mouse is easy to use. The icons on ImageShare could be made clearer but, fortunately, a con-

trasting blue button invites users to toggle between various inputs. Having access to detailed conference information in the system tray during a session without losing sight of the real-time video was valuable and convenient.

Installation, documentation and customer support

Installing a PC-based product is always more complicated than installing an information appliance because there are more opportunities to make errors. We believe most iPower 960s will be set up by professional network managers or systems integrators who will not be surprised to find themselves installing Windows NT.

We found the graphical icons and colored connectors on the boards and cables very helpful during installation. We correctly connected the 11 black cables — one each for camera, microphone, speakers, ISDN BRI 1, ISDN BRI 2, ISDN BRI 3, LAN (Ethernet), display, ImageShare, power and wireless keyboard/remote control — on our first attempt.

In our first calls, we suffered from "cockpit" confusion because we failed to note that the application defaults to "local audio mute" when automatically receiving inbound calls. This, technical support says, is a feature, not a bug, designed to prevent a remote location from eavesdropping on a meeting in a videoconference-enabled room.

During configuration and testing, it is time-consuming and awkward to have the configuration of ISDN, IP settings, local directory entries and other audio/video options in a separate application that will not run when the iPower user interface application is up. Once configured, the advantage of this scenario is that occasional users in a meeting room are less likely to accidentally tamper with system settings.

We didn't use it, but we found the documentation on the system complete and thorough.

Troubleshooting the system is relatively easy for those familiar with NT. The application creates an H.323 log file, recording

every detail in real time. This will help identify a source of problems, but we expect PictureTel to release more robust tools for administrators to avoid configuration and maximize feature functionality.

Management and administration

Because we didn't test PictureTel Network Manager, a plug-in application for Hewlett-Packard OpenView that gives administrators in-depth status and analysis metrics on system readiness and health, we couldn't test PictureTel's net-based system management and administration tools for remote monitoring and session management.

Conclusion

Computer-enabled collaboration is easier to conceptualize than to implement in a product. When you add full-frame, full-motion video with full-duplex audio, the complexity escalates exponentially. We found that PictureTel's iPower 900 series gracefully integrates videoconferencing and visual collaboration. Additions to the iPower product family based on this platform will fit nicely into firms of any size.

Perey is president of Perey Research & Consulting in Placerville, Calif. She can be reached at cperey@perey.com.

NetResults

PictureTel iPower 900 series (960 model with ImageShare)

RATING: 4.53 **COMPANY:** PictureTel, (800) 716-6000, www.picturetel.com
COST: Pricing for the iPower 900 series ranges from \$9,500 to \$17,000, depending on features and network connectivity. A range of displays, peripherals and furniture is also available. **PROS:** Outstanding audio and video. **CONS:** Some minor configuration difficulties.

	Image and audio quality 40%	Features 25%	User interface 15%	Inter- operability 10%	Documentation and support 10%	Total score
iPower 960	5	4.5	4	5	3	4.53

Scoring key: 5: **Exceptional showing** in this category. Defines the standard of excellence; 4: **Very good showing.** Although there may be room for improvement, this product was much better than average; 3: **Average showing** in this category. Product was neither especially good nor exceptionally bad; 2: **Below average.** Lacked some features or lower performance than other products, or than was expected; 1: **Considerably subpar,** or lacking features being reviewed.



Perey is also a member of the Network World Global Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.

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Wired Windows . Dave Kearns

PONDERING NOVELL'S FUTURE

I'm still not sure what to make of Novell's acquisition of Cambridge Technology Partners and its naming of CTP's boss — Jack Messman — as Nov-

ell's new CEO.

Certainly, it's rare for an acquired company's chief executive to become CEO of the acquiring company. But Messman

is no stranger to Novell, having been involved with the Provo, Utah, software house since 1981. It's also true that the current Novell CEO — Eric Schmidt — kept referring to the deal as a "merger, I mean acquisition" during a conversation about the companies' future during Novell's BrainShare conference last week.

Schmidt, while relinquishing his CEO title, will retain the post of chairman of the board and also be known as chief strategist. It's a good thing Drew Major, former Novell chief scientist, has moved over to the recently spun-off Volera Web caching business or there might be some confusion.

Novell has a COO, Stewart Nelson, who was promoted to handle day-to-day administration last year so Schmidt had more time to focus on the "vision thing." Nelson is unsure of his future because he claims he hasn't yet spoken to Messman about what lies ahead.

Evidently not too many people have spoken to Messman about the future. After giving a short, workman-like speech about CTP to BrainShare attendees during opening ceremonies, he quickly ducked out before the rest of the Novell executives faced the press. It appears that only Schmidt and CFO Dennis Raney were aware of the acquisition before it was agreed upon — even Novell's top marketing official, Darin Richins, admitted he knew nothing about the deal before the public announcement.

Messman gave no indication of how he felt about the situation, limiting his remarks to an assessment of CTP's business practices and how Novell could complement them. At dinner the night before, he seemed distracted and uninterested in Novell, its partners and its customers. There are many who feel Messman has been brought in to handle the dirty work of liquidating the company — a chore the mild-mannered Schmidt just couldn't face.

It's possible that last week's event was the final BrainShare, and that would be sad. This was an event that brought together the best and the brightest in networks for a week of learning, give-and-take and interactions that spurred on many of us to do better. Speaking as a 12-time attendee, I'm not sure I'd know what to do with the third week in March without BrainShare. So let's hope our worst fears aren't justified and Novell moves forward once again.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

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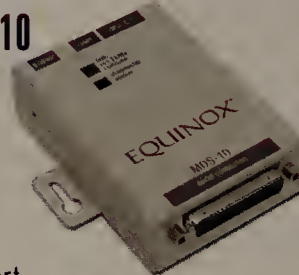
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Tip of The Week



One of the big pieces of news from BrainShare, technically speaking, was that the on-again, off-again porting of eDirectory to IBM's AIX was on again. Gear up for a release later this year — perhaps coinciding with NetWare 6's rollout.

"I opened a virus by accident."

Translation: I opened a virus like you told me not to.



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Net.Worker

Products, services and strategies for tying teleworkers to the enterprise

Briefs

Workers who rely on virtual meetings — either via phone, video or Web conferencing — are happier and more productive than those who rely on in-person meetings only, according to a survey conducted by WorldCom and Modalis Research Technologies. "Meetings in America III: A study of the virtual American workforce in 2001" revealed that 61% of survey respondents reinvested the time saved on travel into other work-related tasks, 49% spent the time with their families and 16% said they would trade a larger salary for more work flexibility and time management freedom.

Netgear and SOHOware each announced small-office broadband routers that employ Stateful Packet Inspection technology used in enterprise firewalls to prevent hacker attacks. Netgear's FR314 Cable/DSL Firewall Router (\$349) and SOHOware's BroadGuard (\$200) each support VPN pass-through, while Netgear's includes content filtering and reporting features.

Netgear: www.netgear.com;
SOHOware: www.sohoware.com

Document services provider NetDocuments signed a deal with Hewlett-Packard to integrate HP scanners, digital cameras and multifunction devices with NetDocuments eServices to digitize, share and store documents and photos on the Web as part of HP's Share-to-Web 2.0 software (www.scanjet.hp.com/products/share_to_web). The partnership enables HP customers to use the Web as a repository of images, files, photos and documents that they can collect, distribute, collaborate on and print from anywhere.

NetDocuments: www.netdocuments.com; Hewlett-Packard: www.hp.com

Gadget love strikes the enterprise

BY TONI KISTNER

For Charlotte Patin, it started last winter, the day she met two Microsoft consultants who had BlackBerry handhelds clipped to their belts. One peek at the wireless e-mail and personal information manager device — complete with tiny thumbable keyboard — and she was hooked.

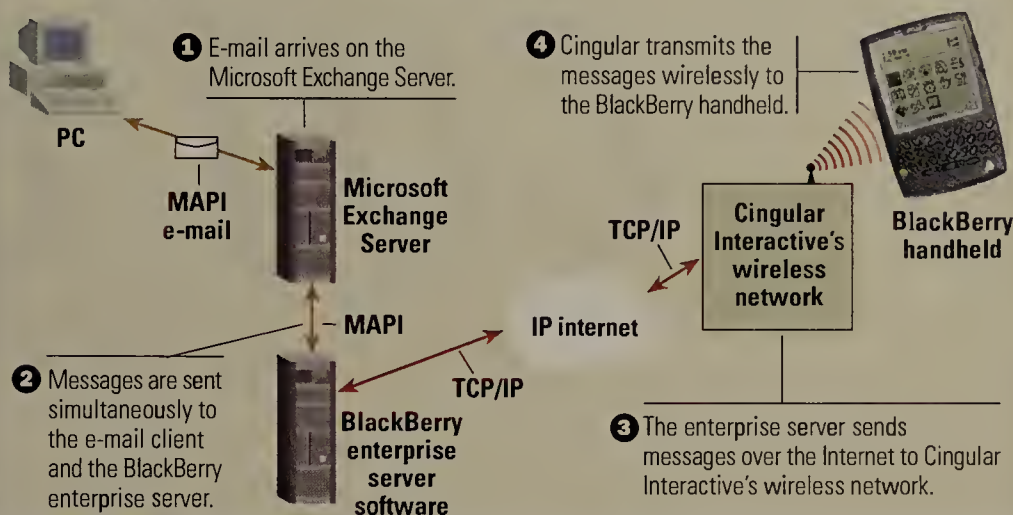
As director of IS for Columbus, Ohio, law firm Bricker & Eckler LLP, Patin wanted to provide the attorneys with wireless access to corporate e-mail, contacts and calendars without having them lug around laptops. Patin's group initiated a plan, launched a pilot program, and today, BlackBerry 957 handhelds are standard issue to all 115 Bricker attorneys, and employed as a recruitment tool for young associates.

Research in Motion (RIM)'s BlackBerry, which comes in Internet and enterprise versions, is this year's corporate darling. While there are only about 150,000 subscribers nationwide — less than the Palm VII according to The Yankee Group — BlackBerries have become must-have tools, primarily in the financial and technology sectors. While devices such as the Palm VII and Motorola TimePort let you wirelessly access Post Office Protocol mail accounts, RIM's secret sauce is the ability to integrate with Microsoft Exchange and Lotus Notes mail systems.

From the Exchange or Lotus Notes server, messages are sent to the desktop client and the BlackBerry simultaneously, obviating the need for message synchronization routines and separate wireless e-mail addresses. Message management features let users set filters, receive only message headers and delete blocks of

BlackBerry enterprise solution: How it works with Exchange

With a BlackBerry server, administration and control of mobile e-mail is centralized.



messages by date. Moreover, messages are Triple-DES encrypted, providing the strongest security available.

The BlackBerry 950, which looks like a traditional text pager, costs \$399, and the larger palm-sized BlackBerry 957 is \$500. Wireless service from Cingular Interactive (formerly BellSouth Wireless Data) ranges from \$40 to \$74 per user per month, with higher costs including enhanced paging and roaming in the U.S. and Canada. The BlackBerry Enterprise Server costs \$3,000 for 20 users, and additional packs of 10 client licenses cost \$490.

"I'm not a gadget person, but you can't pry it out of my fingers," Patin says.

Though many people interviewed expressed nothing but praise for RIM's setup and management, many had a short list of complaints. Patin's primary one is coverage, which is concentrated in metro-

politan areas. "Some partners live in suburbs pretty far from Columbus, and when they travel five minutes in the opposite direction, coverage stops," she says.

We also heard a universal plea for attachment support, which is being offered by some third-party providers. Some wish for a backlit keyboard and brighter screen. Those looking to update calendars wirelessly will be glad to know BlackBerry 2.1, announced this week, adds the capability, as well as a text cut-and-paste feature.

But beyond helping mobile professionals stay on top of e-mail, the BlackBerry is also helping some IT managers better manage their networks — and their bottom lines. Mohamad Al-hashish, director of infrastructure at Hidden Mind, a wireless device software development company near Research Triangle Park, N.C., manages a fleet of 50 BlackBerry devices used by Hidden Mind's executive, sales, marketing and IT teams.

"All my engineers use the 957s to help us monitor the network. We use 3Com's Transcend Management Software to monitor the switches, and if they go down, we get an e-mail notification," he says. Because Hidden Mind uses a Shoreline Communications' IP phone system, Al-hashish also receives e-mail notification of incoming phone messages on his BlackBerry. While he can't take the call, Al-hashish gets the caller's number, same as a numeric page.

Hidden Mind also boasts a nearly 50% decrease in mobile phone usage since bringing in the BlackBerry devices. "We've dropped everybody down to about 250 minutes per month," Al-hashish says. "That's a really good savings for us." ■

Send out the software

BY DENI CONNOR

Traditionally, IT managers have relied on management suites such as Intel LAN-Desk to distribute new applications, software updates, patches and drivers to users. But while such products are good for workstations that routinely connect to the network, they're of little help to disconnected remote workers. While it's possible to distribute software using a remote-control application such as PC Anywhere, the target PC must be online, the user's

dial-up connection might be too slow to transfer a large file, and productivity is interrupted during the control session.

The problem involving getting software to remote workers is bound to increase. Gartner Group predicts that this year more than 25% of all workers will be mobile and that 30% of IT resources will be devoted to supporting them. By 2002, Gartner estimates that more than 108 million employees will work beyond the bounds of the traditional office.

See **Remote**, page 44

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E-Commerce: The Sell Side of B-to-B Is a Matter of Survival

Lightning-fast advances in Internet technologies have made e-commerce an absolute necessity for dot-coms and brick and mortar businesses alike. Even conservative estimates place the volume of e-commerce transactions this year at hundreds of billions of dollars, others at up to \$2 trillion, and rising sharply for the next several years. Executives at all levels of the corporation are asking simply, "Are we ready?"

The direct answer is, "It depends." Whether buying office supplies, making travel plans or ordering machine tools, these customers want unparalleled self-service features; personalization of the highest order; and rich content to enhance their buying experience.

So you need to ask the right questions. How do packaged e-commerce solutions stack up to customized approaches? How tough is it to tie the Web front-end to existing back office systems? How e-commerce ready is the existing infrastructure? Should you incorporate mobile commerce into your business model?

Join Unisys experts, clients, partners and industry analysts as they examine these questions in a Webcast on March 27, 2001 at 11am EST. Structured as part seminar, part panel discussion and part Q&A, this 45 minute Webcast will help you determine which e-commerce solutions best meet your business needs and provide the greatest return on your investment. For more information and to register for the Webcast, visit www.unisys.com/e-biz/Webcasts.

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Net Worker



Telework Beat . Toni Kistner

TOOLS FOR FOOLPROOF FILE MGMT.

Editor's note: This is the second of a two-part online series.

Last week, in my weekly online column (www.nwfusion.com, DocFinder: 3522), I suggested a slightly unorthodox plan for bringing your boss around to telework. What I failed to mention was the risk involved. If you leave a critical file behind in the office, or rely on a buggy home PC that goes awry the very day you work from home, you'll inadvertently confirm management's worst fears: that telework has stranded you at home with nothing to do. It's a good thing there are two neat tools that take the risk out of shuttling work between two places.

For full-time laptop users, Mobiliti's Network Unplugged (\$59.95 for single user; \$124.95 for network version) is a file-synchronization and back-up tool that replicates the look and feel of the network on your laptop or remote desktop so you can work offline same as you would online. It replicates network files, structure and look and feel onto your laptop, maintaining a consistent environment. The new version, 3.0, includes an enhancement to the synchronization technology called Intelligent Delta Selection

Process that ensures only the portions of files that have changed are transmitted, speeding performance when backing up big data files like your Outlook PST.

If you've got a desktop PC in the office, you're either e-mailing your work home or toting a floppy or ZIP disk. Worse, you're mixing work and personal files on the home system, which could put your corporate data at risk. An intriguing alternative is GoToMyPC. An application service provider service from Expert City that will launch in May, GoToMyPC lets you dial in to your corporate system from any machine with Internet access — be it your home PC, a system at a client site, in an Internet café or hotel's business office — and remotely access your corporate desktop, files and applications just as if you were at your desk. Of course, the system you're accessing needs to be up and running and connected to the Internet — that's why the service is geared to part-time teleworkers who have a broadband-connected PC at home.

Setup involves registering the PC you want to remotely access at the GoToMyPC Web site. The technology compresses, encrypts and passes screen images at a fast rate, according

to Brian Donohoo, Expert City's senior vice president of products. The data stream is encrypted at 128 bits, and your user account is password-protected, as is the target PC. What's more, the service lets you remotely access applications on your desktop over a VPN, so you can use applications on your home system that aren't supported by your home PC's platform, such as mainframe and Linux. This method lets you keep all your files and applications on one system; you're just accessing it from two places.

Right now, you can try out a beta version for free. Come May 1, when the service launches commercially, it'll cost between \$9.95 and \$24.95 per user per month. Corporate pricing is structured per number of PCs enabled, but Donohoo says support for 10 remote workers will cost about \$250 per month.

Both Network Unplugged and GoToMyPC come in stand-alone and network versions. So you can buy the stand-alone for yourself first, then when the time is right, pitch it to your IT manager for the network.

Kistner is the managing editor of the Net Worker section. She can be reached at tkistner@nww.com.

Remote, continued from page 41

So out of necessity, IT managers are getting creative. Some are turning to PC cloning packages such as Altiris' eXpress or Symantec's Norton Ghost to create an image of the user's PC configuration. eXpress supports mobile PCs with self-extracting software distribution packages that can be e-mailed or burned to a CD-ROM and sent to a user. This software can also remotely clone and configure PCs, install software, and manage PCs on a day-to-day basis, providing disaster-recovery capabilities.

Others like Michael McKenney are burning programs to CD-ROMs and sending them to remote workers in the mail. On a monthly basis, the IS manager for Americorp Financial in Birmingham, Mich., distributes software to his remote users containing all the patches for applications. "Users are also responsible for upgrading all the Symantec products [we use] — Norton Antivirus, Norton Utilities and WinFax — on their own using the Internet," McKenney adds.

Other IT managers are experimenting with posting software to a secure location on the company intranet for remote employees to download. A network man-

ager in Tennessee who asked not to be identified explains, "We use Winzip to create install sets and place them on the Web site for user download. When they attempt to access the site, users are authenticated with the network and guided to areas where they can download information."

Company intranets may turn out to be the easiest and most reliable way of supporting users — on site and remote. Novell uses one through which its employ-

ees can download drivers, get instructions on how to perform certain tasks and receive software updates. Terry Roedecker, senior network administrator at MidFirst Bank in Oklahoma City, Okla., says such Web portals may be catching on. Even though Roedecker uses Intel LANDesk Management Suite for distributing software today, he's looking forward to adding a portal for MidFirst's employees, so that he'll have several alternate ways to distribute software. ■

Taking the traditional approach

These network management tools combine remote software distribution with inventory and diagnostic functions.

	Network	Updates	Price
Microsoft Systems Management Server	Win NT/2000 and SQL Server	Win NT/95/200	\$1,130 for 10 users; \$1,780 for 25 users
Intel LANDesk Management Suite	Win NT/2000 and NetWare	Win NT/95/2000	\$1,000 for 10 users; \$6,250 for 100 users
Novell ZENworks for Desktops	Win NT/2000 and NetWare	Win NT/95/2000	\$590 for 10 users; \$1,375 for 25 users; \$5,900 for 100 users
Synchrologic iMobile Suite	Win NT/2000	Win NT/95/2000, PDAs, smart phones and Win CE handhelds	\$450 per user

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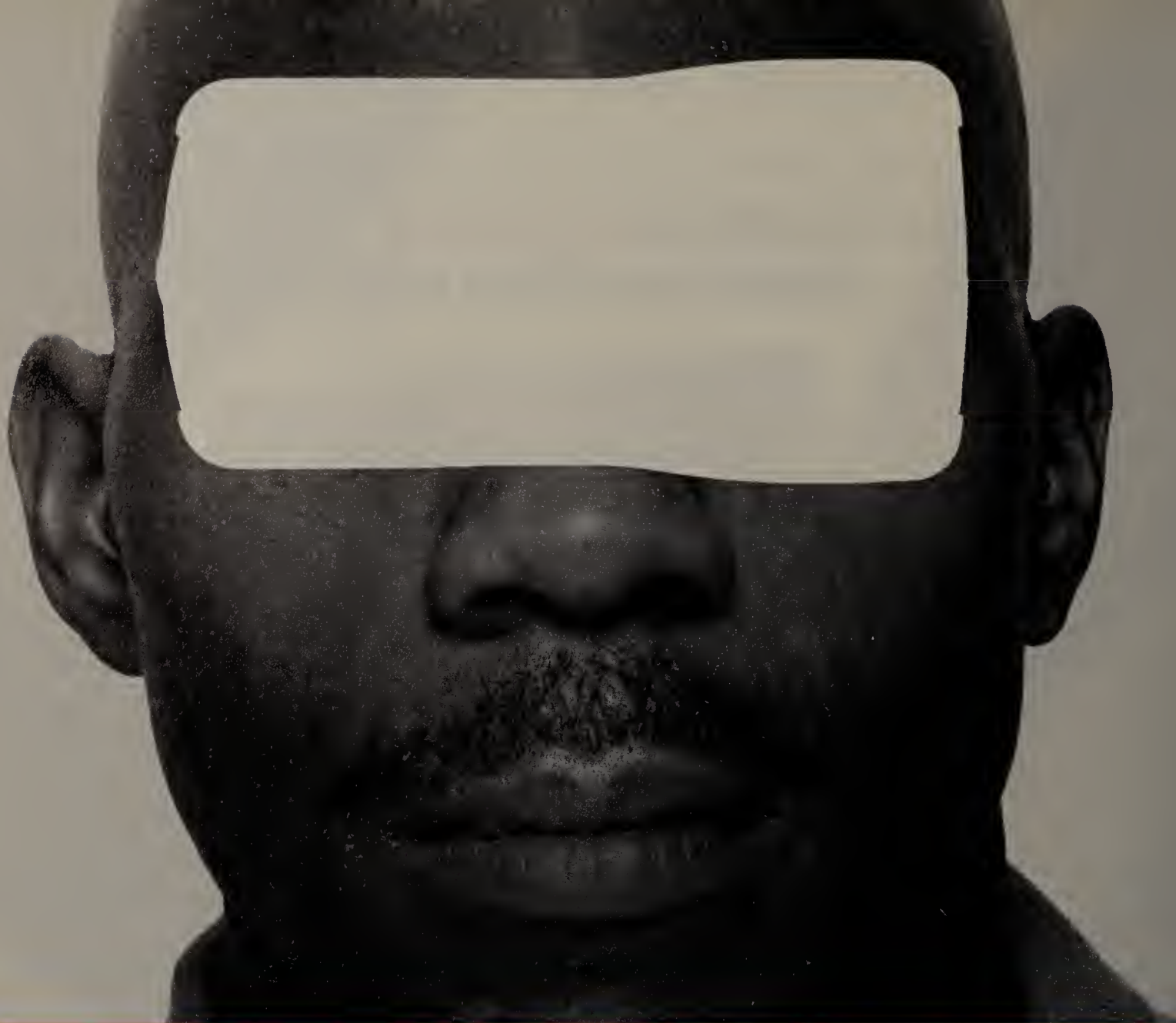
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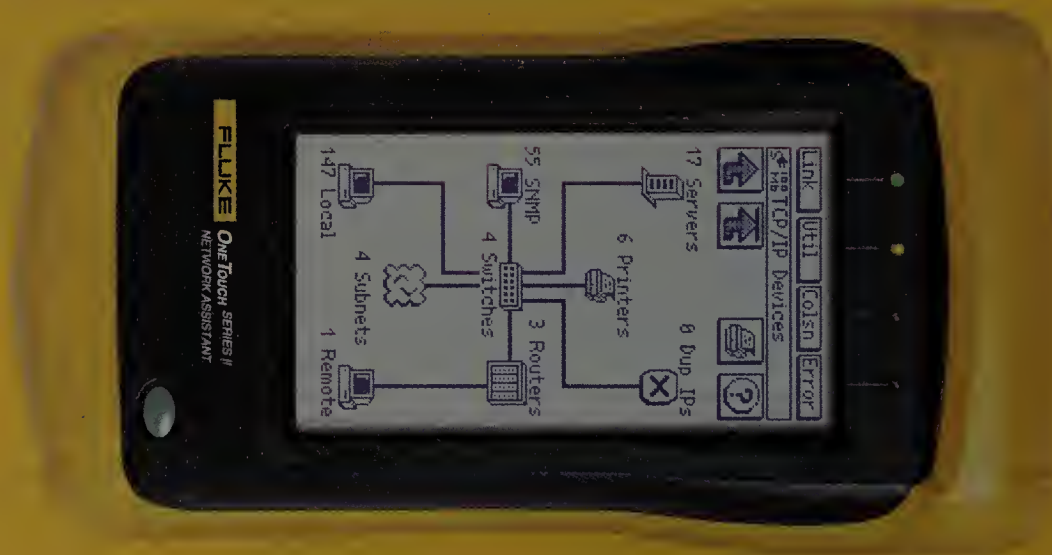
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Briefs

Services and hosting company **Broadwing Communications** and **Internap Network Services**, an intelligent routing service company, have announced agreements with **Akamai** to resell the latter's services. Broadwing will add Akamai's **EdgeSuite**, a set of content delivery services bundling many of Akamai's offerings, to the company's managed hosting and collocation services. Internap signed a similar deal to sell Akamai services along with its own. Internap works to improve the speed data moves within the Internet for its customers, while Akamai works to move that data out of the Internet to the edge of the network.

Verizon Wireless last week announced a \$5 billion deal with **Lucent** that will have Lucent provide Verizon with most of the equipment for the service provider's next-generation 3G wireless network. Verizon Wireless plans to begin deploying 3G technology later this year. The Lucent gear would let users get up to 144K bit/sec access through their mobile phones, enabling more data-rich applications.

Verizon: www.verizon.com

Terabeam, the Seattle provider of free-space optical telecommunication service, plans to begin offering service in Denver this summer. The company builds high-speed networks in metropolitan areas using lasers beamed through the air to connect sites. The company also sells services in Seattle. Denver is the second market in which Terabeam will offer service. In February 2001, Terabeam officially opened for business in Seattle.

Terabeam: www.terabeam.com

Metricom woes concern WorldCom

BY DENISE PAPPALARDO

SAN JOSE — Metricom's journey through rough financial waters may be kicking up waves at WorldCom, the wireless data network provider's largest reseller partner.

Metricom last week announced it is eliminating about a quarter of its 800-person workforce. The layoffs come as part of an effort to raise as much as \$500 million, says Lisa Pierce, director of telecommunications at Giga Information Group.

The service provider is building a fast wireless data network to support its Ricochet service. Companies such as WorldCom resell this service to their own customers under their brand name. The service lets users download e-mail and surf the Internet at 144K bit/sec from a car, train or office.

Lacking a wireless net of its own, WorldCom depends exclusively on reselling such services. This puts the company in a precarious situation when its reseller partners suffer. In this case, WorldCom will not be able to expand its mobile data offerings anytime soon, especially if Metricom institutes a lengthy moratorium on expand-

ing its network.

"Every time companies turn up digital wireless networks people underestimate the cost, time and effort needed to get these things off the ground," says Jack Gold, a vice president at The Meta Group consulting firm. "It's a Catch-22. Companies can't generate large amounts of revenue until the service is available in many markets. In order to make the service available in many markets, you need a costly

network that's widely available."

Metricom is laying off employees because of its ghastly year-end 2000 financials announced in February. Net losses of \$114.4 million far exceed revenue of \$2.4 million.

Besides low cash flow, the company is also going through executive shifts. In late February Ralph Derrickson took over as interim chairman and CEO after Timothy Dreisbach resigned.

The company would not comment further on the layoffs, but a spokeswoman says Metricom will continue to support existing customers and its network in 15 markets. She added that the company has slowed network deployment during this "evaluation" period while it devises a new business plan.

A company spokeswoman says WorldCom executives were meeting with Metricom to determine how the company's cost cutting will impact the carrier.

Today, WorldCom is offering customers wireless data services in seven markets. But why WorldCom would continue to invest time and marketing dollars in a service that may not grow over the next 12

See **Metricom**, page 48

www.nwfusion.com

WIRELESS WAITING

Follow our news links for more on WorldCom. Also, learn how the rapid growth of wireless will affect IT managers, teleworkers and your company with our wireless research page.

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3527
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McLeodUSA to purchase VPN vendor Intelispan

BY MICHAEL MARTIN

McLeodUSA revealed last week that it will acquire Atlanta VPN and network services firm Intelispan for \$40 million in stock to enhance the competitive local exchange carrier's VPN portfolio.

McLeodUSA already offered customer premises equipment-based VPNs for business customers, but the acquisition of Intelispan should let McLeodUSA deploy VPNs more effectively because Intelispan brings impressive back-office and provisioning tools to the table, says Robert Carlson, an analyst with research firm Current Analysis.

"I don't think Intelispan had much of a customer base or much money flowing in," Carlson says, "so what McLeodUSA has to be interested in is their software system."

The software includes Inteliwatch, a remote network monitoring tool that tracks network hardware and software, and the Automated Diagnostic Tool and

One Button Dialer, which are supposed to make the VPN turn-up process more automated.

"This could help McLeodUSA lower their implementation costs," Carlson says.

Intelispan's services will complement the assets McLeodUSA acquired last year in a \$2.1 billion deal when it picked up network firm Splitrock Services, Intelispan spokesman Ponder Harrison says. Splitrock is now the data services division of McLeodUSA, providing broadband services to ISPs, telecom firms and companies across the U.S.

Harrison says most of Intelispan's customer base consists of small and midsize companies, although the firm does have some large corporate customers.

In addition to providing hardware- and software-based VPN services, Intelispan offers a suite of managed network services, he says.

When the acquisition closes, probably some time in the second quarter of this

Spanning the VPN gamut

Here's what Intelispan brings to McLeodUSA:

- **Inteliwatch:** A remote network monitoring service that tracks network components.
- **Inteligate:** A suite of VPN offerings based on Inteliguard, a PKI X.509 digital certificate product, and managed gateways.
- **Intelipro Design and Implementation:** Services that include business and technology assessment, network performance analysis, project management, network design, and security design and analysis.

year, Intelispan will become a wholly owned subsidiary of McLeodUSA.

McLeodUSA is a facilities-based CLEC that provides voice and data services to retail and wholesale customers across the U.S.

McLeodUSA: www.mcleodusa.com; Intelispan: www.intelispan.com

Exodus offers metro Ethernet services

BY MICHAEL MARTIN

SAN FRANCISCO — Some Exodus Communications data center customers

will soon have easy access to metropolitan Ethernet services courtesy of an agreement reached last week between Exodus and metropolitan Ethernet

provider Yipes Communications.

Under the agreement, Exodus will begin rolling out and reselling Yipes' service in many of its data centers. The first

centers to be connected will be those in Boston, Chicago and Silicon Valley.

Yipes offers businesses bandwidth on demand in 1M bit/sec increments. For businesses to take advantage of the Yipes-Exodus service, they would need to make sure their local Exodus data centers were hooked up to the Yipes service, and they would need to get a Yipes connection to their business sites.

The reseller agreement makes sense for Exodus and Yipes, says Rosemary Cochran, an analyst with research firm Vertical Systems Group.

"It's a logical extension for Exodus customers given the types of applications they're hosting," she says. "Yipes is looking for customers like this who require a lot of bandwidth."

So far, Cochran says, the demand for metropolitan Ethernet services has not been overwhelming.

"Only a subset of customers are real candidates for those services," she says. "The issue is these networks are only in very high density areas and if all your locations aren't in high-density areas, then the metro Ethernet doesn't help much."

Yipes operates in 20 U.S. markets.

"When you think of the richness of the content flowing out of the Exodus data centers, there's a really good opportunity here," says Ron Young, Yipes co-founder and chief marketing officer.

Application service providers (ASP) are one example of Exodus customers that could take advantage of Yipes' services, Young says. ASPs often need to set up high-bandwidth connections so customers can access their hosted offerings, and Yipes could provide an alternative to traditional carrier services.

Exodus: www.exodus.net; Yipes: www.yipes.com

Metricom,
continued from page 47

months is unclear.

WorldCom will likely continue its resale arrangement with Metricom for the near term, but resale is not a good long-term strategy, Giga's Pierce says.

"If the mobile services market is a fraction of what some predict, WorldCom will have to look more seriously about merging or acquiring a company with wireless assets," she says.

A merger with a company such as SBC Communications could make sense, she says. SBC has a large portion of the wireless market with 19 million Cingular Wireless customers. WorldCom's Bernie Ebbers has publicly refuted such speculation, but not everyone is convinced.

"It will take at least three years to turn these ships — meaning AT&T, Sprint, WorldCom — around. Now it's a question of whether Ebbers intends to endure a tumultuous and painful extended period as WorldCom's chief," Pierce says. ■

Tie the circuit switched world into the IP universe



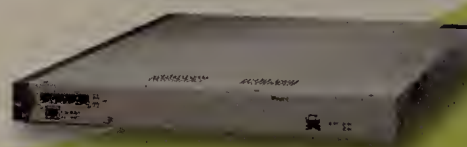
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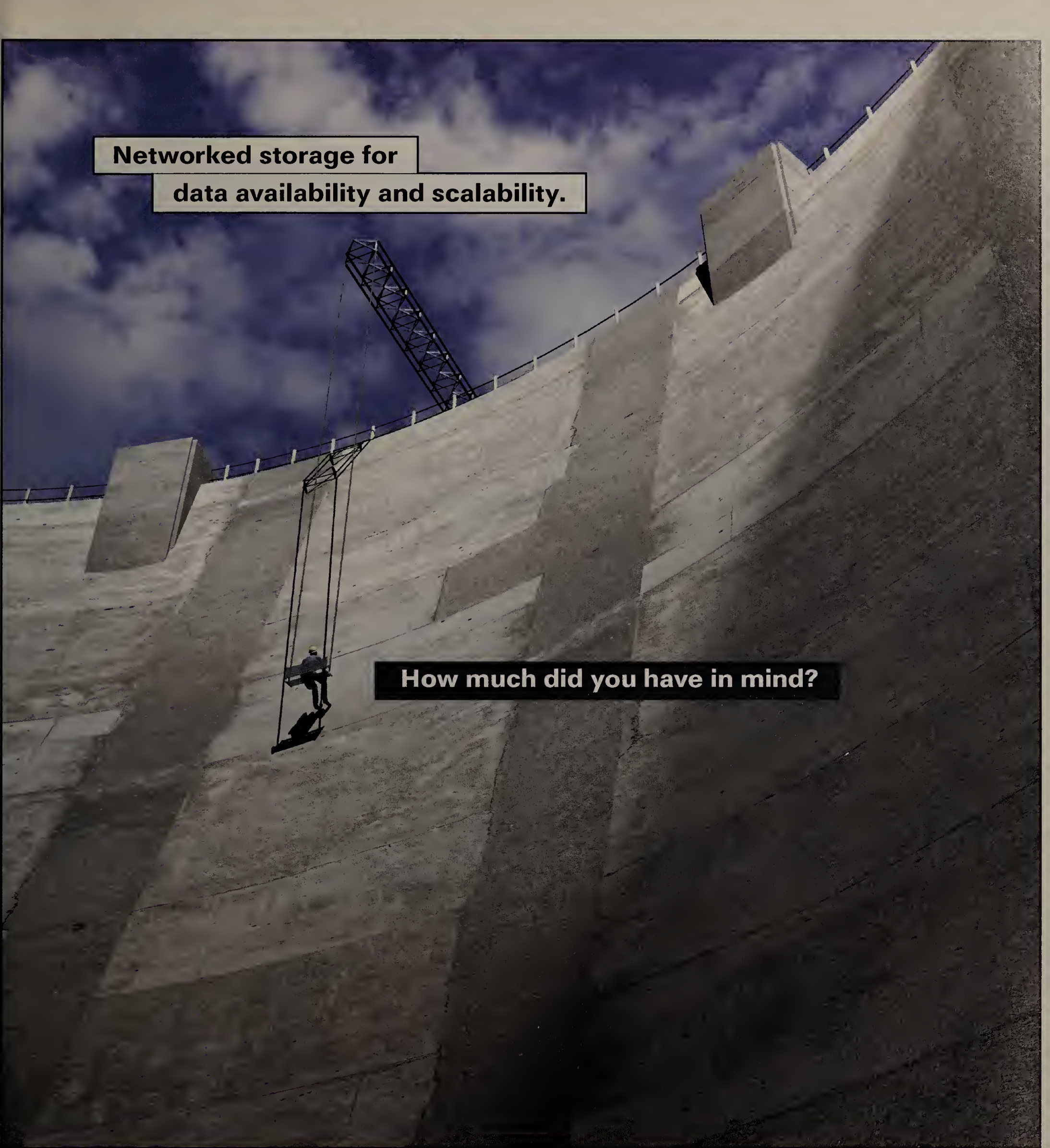
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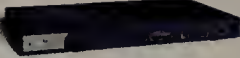
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The Edge

Service provider developments at
the juncture between the enterprise
and the new public network

Briefs

Avici Systems and Orchestream last week announced that Orchestream's modeling software now supports Avici routers. This support will let network operators turn up IP VPN and Differentiated Services with Avici routers in the core, and Nortel Networks and Cisco routers at the edge. Services will be based on Multi-protocol Label Switching and other quality-of-service features.

Avici: www.avici.com; Orchestream: www.orchestream.com

Fujitsu Network Communications last week announced it is supplying **Integra Telecom** with more transport equipment to build out its network. Integra will deploy Fujitsu's Flash SONET and dense wave division multiplexing transport equipment in several of its new networks in Oregon and Washington. Fujitsu will provide its Flash2400 ADX, Flash600 ADX, and Flash-192 equipment to connect Integra's regional hub switches with collocated facilities in Qwest Communications central offices. The equipment will be ready for commercial service by the second quarter.

Fujitsu: www.fnc.fujitsu.com; Integra: www.linkport.com

Village Networks and OMM, a supplier of photonic switching subsystems based on MicroElectroMechanical Systems technology, last week announced plans to develop an optical subsystem architecture for scaling metropolitan and regional nets.

The subsystem will let Village Networks' iOPN2000 optical packet switch scale to a 64-by-64 switch matrix using two-dimensional MEMS technology. The iOPN2000 is in trials with major carriers.

Village Networks: www.villagenetworks.com; OMM: www.omminc.com

Valiant does stress testing for carriers

BY JIM DUFFY

With new gear hitting the market to help unleash bandwidth and foster dynamic provisioning, one requirement may have been overlooked: Who's going to help service providers test, evaluate and certify this equipment for production use?

That area is being overlooked no more. Enter Valiant Networks, a 16-month-old company founded by technicians and marketers from carriers and their vendors.

"These guys are a crew of heavies," says Frank Dzubeck, president of Communications Network Architects in Washington, D.C. "They were known for their ability to break things" when they previously worked for carriers.

Valiant was created to provide a neutral environment to test and validate optical, packetized voice, and IP and Multi-protocol Label Switching (MPLS)-based data network equipment. Until now, carriers had to devote internal technicians or enter into risky arrangements with product-biased vendors to kick these new tires, the company's executives say.

"There's really not been anyone to step up and play this role," says Valiant

PROFILE: VALIANT

Location:	San Jose
Services:	Technical product evaluation; outsourced management of carrier networks.
Management:	T.J. Fitzpatrick, CEO; Wayne Price, CTO
Financing:	\$21 million, \$16 million in debt. Investors include: Kleiner Perkins, Norwest, Matrix Partners, Battery Ventures.
Revenue:	\$5 million for 2001 (estimated)
Employees:	120
Customers:	Cyras, Amber Networks, Looking Glass.

CEO T.J. Fitzpatrick, former president of Nortel Networks' carrier data and enterprise voice groups. "[Carriers] give up their multivendor options with a single vendor evaluation."

Carriers can enter into these single-vendor assessment arrangements via vendor financing deals on new equipment purchases. They can also be persuaded into a single-vendor testing/validation by the marketing clout of the vendor.

A third inducement could be the vendor's "end-to-end" pitch. A system built from access through edge to core is likely to work better if all components come from one supplier, the vendor might say.

In each case, "you still need someone to keep the vendor honest," Fitzpatrick says. In one instance, Valiant cut the number of devices needed in a carrier's network from 50 to 25 by reevaluating a single vendor's assessment, he says.

Valiant has built and continues to expand a "knowledge base" of network equipment from a variety of vendors. Valiant has also constructed a network operations center (NOC) where it emulates and manages a service provider network. From here, Valiant can perform contract, outsourced management.

A challenge for the firm is that service providers could build or bolster their own testing/operations/management capabilities little by little once capital starts to flow more freely again.

"They built these NOC facilities for service providers, but guess what? The first thing the service providers do when they get going is they go and build their own NOC," Dzubeck says.

Valiant: www.valiantnet.com

Clarent brings voice over IP to the local loop

BY PHIL HOCHMUTH

PHOENIX — Clarent last week announced two products that could help put bundled IP voice and data offerings on service providers' menus.

The voice-over-IP equipment firm will introduce a new softswitch and customer premises gateways for delivering voice-over-IP services to small and midsize companies and into multitenant buildings.

The softswitch and gateways, deployed in a central office and customer site, can provide firms with voice-over-IP services over standard Ethernet wiring in a building, or over regular phone wiring through very-high bit rate DSL (VDSL) technology.

Clarent's Customer Premises Gateway is designed to sit in a multitenant building and connect users with IP voice through Ethernet, VDSL or cable modems. The gateways can connect up to four standard telephones with RJ-11 connections.

The softswitch combines Clarent's Call Manager and Command Center software

products into a hardware platform that acts like a Class 5 telecom switch. The device would sit in a service provider's central office and connect customer sites to the public switched telephone network or other Clarent Trunking Gateways for connecting to the Internet.

Clarent has fared well in selling voice-over-IP gateways for use in the network core of packet telephony providers. The company's gateway products handled the most phone-to-phone IP telephony call volume in 2000, with 31.6% of the 1.3 billion worldwide minutes, according to a study by research firm iLocus, beating out Cisco and Vocaltec.

One analyst sees Clarent's move into the local loop as a smart move, as more and more small and midsize businesses are starting to look for converged voice/data services from their carriers.

"Service providers are generally recognizing that packetized voice will be the way for them to gain revenue" by selling voice minutes, says Christin Flynn, an ana-

lyst with The Yankee Group.

The OpenAccess equipment is available now and will cost between \$150 to \$350 per end user, the company says.

Clarent: www.clarent.com

www.nwfusion.com

DIRTY LITTLE SECRETS

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Briefs

Mirapoint today announces its next-generation messaging appliance for large corporate networks. Mirapoint's new **Message Director** replaces separate message switch and router appliances with a single box. Mirapoint adds new security features including antivirus, antispam, content filtering and unified logon. Message Director works with all standards-based messaging software packages, including Microsoft Exchange and Novell Groupwise. Message Director starts at \$26,000 and will be available in April. Initial customers include BMW.

Mirapoint: www.mirapoint.com

Open Market has announced **Content Server Enterprise Edition**, the latest version of its document-management software that now supports XML and Java 2 Enterprise Edition application servers. Content Server Enterprise Edition, which costs \$20,000, adds one new module, called **Marketing Studio**, for creating product promotions on the Web based on customer profiles. The six other modules are Content Server, Content Centre, Catalog Centre, Personalization Centre, Integration Centre and Satellite Server.

Open Market: www.openmarket.com

Blue Martini has shipped **Blue Martini Channels**, its server-based application for selling indirectly to resellers or brokers. Channels, which starts at \$250,000, is part of the Blue Martini 4.0 e-commerce suite, but Blue Martini recast the indirect supplier applications as a separate product.

Blue Martini: www.bluemartini.com

Collaboration server gains offline support

Document management, portal features also highlight latest release of Intraspect's workgroup server.

BY JOHN FONTANA

BRISBANE, CALIF — Intraspect Software last week released the next version of its Web-based workgroup collaboration server, which provides the offline features IT executives crave for support of mobile users.

With Intraspect 4, which was formerly called the C-Business Server, users can now download their workspaces and create, edit or annotate documents offline before reconnecting to the Intraspect server and recording the changes. Offline users also can participate in discussion groups.

Intraspect's server, along with those from competitors such as eRoom and iManage, let groups of users set up online "workspaces" where they can create and share documents and manage projects using tools such as workflow.

Lotus' QuickPlace and Microsoft's SharePoint Portal Server offer similar capabilities.

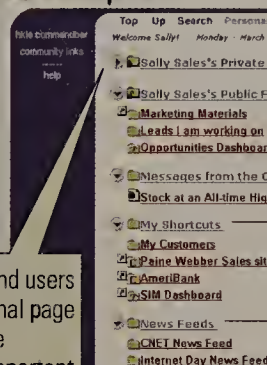
User access is paramount for these systems and Intraspect's inclusion of

No place like home

Intraspect not only has renamed its workgroup collaboration server Intraspect 4, but has also added a number of mobile and user interface features.

Intraspect 4 lets end users customize a personal page that highlights the resources most important to them.

Intraspect



Customized notifications let users set up various alerts such as when automated searches are completed, Web sites are updated or new documents need attention.

mobility features is key.

"We work on location, and with the ability to do it offline we don't have to rely on a connection or deal with bandwidth issues," says Keith Nater, director of strategic and corporate development for Stellcom, a systems integrator focusing on wireless and mobile computing. Nater says another Intraspect feature,

called C-spaces, is beneficial because it lets project managers create customized workspaces for clients. "It simplifies maintenance on our extranet side," he says.

Nater says C-spaces let network administrators create a base set of user and access policies. Project managers See **Intraspect**, page 129

Phonetic Systems takes the calls

BY ANN SULLIVAN

BURLINGTON, MASS. — Companies faced with high call volumes, overtaxed operators and agent-retention troubles may want to look at a new version of Phonetic Systems' auto-attendant software.

PhoneticOperator is voice-activated software that aims to handle the work of live phone operators. Opting for auto-attendant software such as PhoneticOperator can insulate call centers from employee turnover expenses — no small sum, according to a recent study that puts the rate of employee turnover in call centers at twice the national average. It costs the call center industry \$5.4 billion per year to replace employees who leave, estimates Sibson & Company, a subsidiary of management consulting firm Nextera Enterprises.

In an enterprise network, PhoneticOperator typically sits behind a PBX on a dedicated Windows NT/2000 server tied to the corporate LAN. When calls

come in, PhoneticOperator picks up and prompts callers to speak the name of a person or department. The software searches a database and then routes the calls to on-site extensions or branch offices.

The software can be tied to an existing corporate database containing, for example, employee contact information and answers to requests for directions, office locations or operation hours. In Version 4.0, Phonetic Systems added support for Lightweight Directory Access Protocol.

Version 4.0 features SNMP support that lets PhoneticOperator feed information to net management systems so administrators can monitor server conditions and drill down to identify problems. Earlier versions did not have an SNMP-capable interface.

Also new to Version 4.0 are digital interfaces, such as ISDN Basic Rate Interface (BRI). Previous versions supported only analog interfaces.

The option to add BRI particularly interests Mark Aanstoos, a telecom engineer with Fannie Mae. His company has used PhoneticOperator for about eight months — primarily for internal call transfers and companywide directory assistance for its 5,000 nationwide employees — and plans to upgrade to 4.0.

BRI telephony boards will let the company tie the Phonetics system directly to its voice-over-IP efforts, which will cut down on long-distance charges. "We have started installing Cisco Call Manager [servers] in our regional offices, along with IP phones," Aanstoos says. "In Version 4.0, with the BRI interface, we'll be able to route calls over IP directly to the Phonetics system." Before, remote users had to call the Phonetics system from an outside line and were charged long-distance fees, he says. Incoming calls routed by PhoneticOperator to remote offices also incurred long-distance charges.

PhoneticOperator 4.0 is due to ship this week. Pricing varies, primarily depending on the database size. Most installations range from \$50,000 to \$600,000.

Phonetic: www.phoneticsystems.com

'Net Insider . Scott Bradner

OLD BUGS DON'T DIE EASILY

One might think that a vulnerability first described in 1985 would not be a factor in today's Internet, especially if a good way to eliminate the vul-

nerability was published in 1996. But, sad to say, that is not the case.

Reports surfaced recently that Internet consulting company Guardent

claims that an old bug had arisen from a supposed grave.

TCP, described in RFC 793 (www.ietf.org/rfc/rfc793.txt), is the basic reliable data delivery protocol used in the Internet. TCP uses a data sequence number as the basis of its reliable delivery process.

When your computer sends data to another computer on an IP network, it breaks the data stream into chunks, known as packets, for transmission. When it sends each packet, it includes a sequence number that represents all the bytes of data that it has sent up to this time during the specific communication.

The destination host responds with an acknowledgement packet containing the sequence number of the next byte of data that it expects to see. The sender uses this acknowledgement to find out what data has made it to the destination node.

In many environments, trust relationships are defined between hosts — for example, between a file server and its clients. An attacker with the knowledge of what sequence numbers a file server will use and the ability to forge IP addresses can fool the server into thinking it is talking to a trusted client when it is talking to the attacker. Computers can be configured to try to make it difficult to guess what initial sequence number will be used in a conversation.

But there have been problems in coming up with a good way to make it hard to guess the initial sequence number. Robert Morris's February 1985 paper (ftp://ftp.research.att.com/dist/internet_security/117.ps.Z) details the above attack and makes some suggestions on how to prevent it. A decade later, Steve Bellovin published a more detailed description and set of recommendations in RFC 1948 (www.ietf.org/rfc/rfc1948.txt).

But just like the users I mentioned in last week's column on Web site security, system vendors are sometimes not all that good at fixing their software to avoid vulnerabilities, even when the vulnerabilities have been known for a long time (centuries in Internet time).

In the case with TCP, vendors generally tried to plug the security hole after a well-publicized attack in 1994. But they did not then add the additional protections that Bellovin described two years later in RFC 1948 because they were seen as too hard to implement.

But Guardent's report indicates that avoiding the hard work just meant that the problem did not go away. It is a truism in the security area that good security is not easy. This example should be taken as just another reminder of that truth for anyone concerned with the security of his own network and systems.

Disclaimer: Harvard's motto makes a claim for truth, but the observation in this column is mine.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.



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Technology Update

An Inside Look at the Technologies
and Standards Shaping Your Network

Gigabit Ethernet storage networks

BY ROBERT HORST

The need for Internet storage has exploded over the past few years. Businesses are demanding ubiquitous network storage that supports multiple platforms — and they're getting it, through Fibre Channel storage-area networks, network-attached storage and Gigabit Ethernet SANs.

Fibre Channel offers advantages for companies with a large investment in data that want to ensure raw data blocks are readily available where necessary. Fibre Channel SANs offer high performance and the ability to back up data offline, but have a high cost of ownership due to their complexity, expense and the difficulty of finding IT professionals with expertise in Fibre Channel and associated standards.

NAS is a way of attaching storage to standard networks, but a NAS appliance is actually a small file server that uses a file-sharing protocol to let clients access the storage. A NAS appliance does not directly connect the storage to the network, and applications that require access to raw block-level storage, such as databases, cannot run effectively.

Gigabit Ethernet SANs benefit from the fact that IT professionals know how to work with Ethernet and that virtually all businesses are wired for Ethernet. They also benefit from the built-in advantages of TCP/IP: It automatically retries when it fails to make a connection, it correctly orders the blocks of information it receives, and it provides automatic failover to other pathways.

Gigabit Ethernet SANs are relatively easy to install and scale, and provide redundancy for reliability. With external SCSI limited to a 50-meter range, the technology is restricted to use within buildings or campus settings. By enabling SCSI commands to be put in TCP/IP packets, Gigabit Ethernet removes these distance restrictions, helping to create the potential for a surge in Gigabit Ethernet implementation.

How Gigabit Ethernet works

Gigabit Ethernet provides the best price performance of all the leading high-speed LAN technologies. It delivers the lowest cost per data rate — less than \$2 per megabit per second.

An important consideration is that Gigabit Ethernet is switched Ethernet,

not loop Ethernet. Loop Ethernet is vulnerable to datastream collisions that can reduce performance by as much as 30%. Switched Ethernet switches traffic automatically so there are no collisions.

Gigabit Ethernet is easy to install. IT staff can literally plug a storage box in and grant access to all the storage on the system. Scalability is easy, too. The network can be upgraded simply by running switches to switches because TCP/IP will automatically load-share if there are multiple connections to the box.

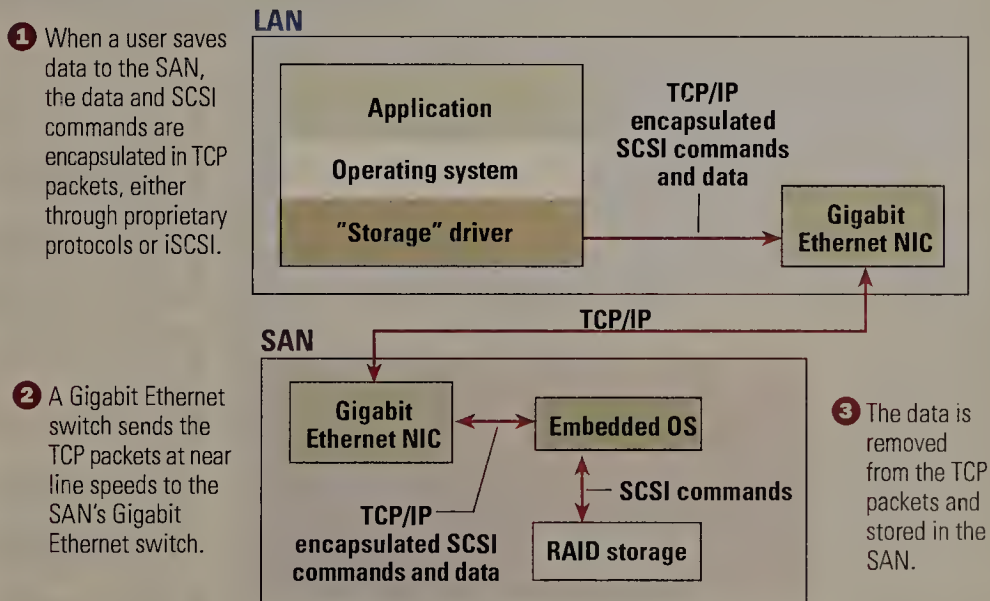
SCSI commands are put in TCP packets, sent across the network, and then taken out of the packets again.

However, while proprietary solutions have some technological advantages, industries as a whole benefit from standards. Within the Internet Engineering Task Force, a working group is now defining and implementing iSCSI, with the goal of creating working implementations within six months. Groups are working on a direct-attached file system to address the limitations of NAS, but DAFS will not obviate the need for storage connected directly to the network,

HOW IT WORKS

Ethernet-based SANs

In a Gigabit Ethernet SAN, data and SCSI commands are encapsulated in TCP packets, then sent across the network.



A system could use all three storage methods, because Fibre Channel and Gigabit Ethernet could interface through a "bridge," and a NAS application server can use any external storage, including Fibre Channel SAN or Gigabit Ethernet SAN.

Industrywide, there's a priority on maximizing the efficiency of network storage over Ethernet. By creating a storage protocol that encapsulates SCSI for travel over Ethernet, storage is shared at near line speeds. Proprietary Gigabit Ethernet solutions are available that let businesses use Ethernet as a storage network infrastructure. These solutions use the same process as when data is stored on a PC's local disk, except the data and

instead of through an intermediate file server.

A fully implemented iSCSI protocol will facilitate interoperability and remove philosophical objections to transferring storage on Gigabit Ethernet. Even without iSCSI, however, Gigabit Ethernet offers a cost-effective, implementation-friendly solution. It may be even more attractive with the upcoming availability of 10G Ethernet, which will deliver a tenfold increase in speed with a simple change of a switch and a network interface card.

Horst is vice president of research at 3ware. He can be reached at bob.horst@3ware.com.

Ask Dr. Intranet

By Steve Blass

We're not convinced that a firewall is necessary. Our current setup is Windows 2000, Service Pack 1, running Active Directory.

Network Address Translation is enabled, and NetBIOS is shut off on the network interface card facing the Internet. All the shares are hidden (sharename\$), and all the shares having "everyone" in the ACL is removed. With this setup, we assume a firewall is not necessary. The reasons include: 1) Win 2000 with Active Directory and the policy set correctly means no one can see any shares unless they are authenticated; 2) NetBIOS isn't enabled, hence the service can't be taken advantage of; 3) all shares are hidden, and logon scripts map to them, and 4) only certain authorized users have rights to the shares.

Relying on Win 2000 Active Directory's protection of the policy data may be safe, despite its reliance on DNS. I'd direct you to the SANS Windows Security Digest Archive for current information about Win 2000 security at www.sans.org/newlook/digests/ntdigest.htm. You can e-mail digest@sans.org with the subject "Windows Security Digest" to get your free subscription. I recommend securing the servers and the network perimeter. There's so much more to the possibilities of TCP/IP networking than one security mechanism can manage. Vigilance is the key, along with traffic monitoring, analysis and control capabilities.

Blass, a network architect at change@work in Houston, can be reached at dr.intranet@changeatwork.com.



Gearhead . inside the network machine . Mark Gibbs

SAVIN' THE SURF

First, let us compliment Bob Muir, the only reader to write last week and point out that we used "darpa" in several places where we, of course,

meant "arpa." Muir's exact comment was "Hmmm, that's what happens when you're writing from memory? :-)". No, that's what happens when you are older

than you'd care to recognize.

Be that as it may, we're taking a break from DNS this week to review a product that we've used for some time and now could not live without — SurfSaver from askSam Systems (www.asksam.com). SurfSaver is a browser add-on that does what its name suggests: On command, it

saves the contents of the pages you load into your Web browser. The result is a searchable database of Web pages.

If you are doing online research or simply want to save Web pages that interest you, this is the best product we've seen so far. One of the great uses we've found for it is to archive the contents of useful URLs sent by co-workers so we can peruse them while we sit on airplanes.

Installation is painless and quick. SurfSaver scans your system for browsers (it is compatible with Internet Explorer 4+ and Netscape 4+) and allows you to select any or all browsers installed. Then whir-whir, clunk-clunk, and it's installed.

In operation, SurfSaver is invoked under Internet Explorer through a button on the standard tool ribbon or by a context menu you call up by right clicking on the Web page. Under Netscape, the SurfSaver button appears on your personal toolbar and on the menu under the bookmarks button in the location toolbar, but unfortunately not in the right-click context menu.

Under either browser, clicking on the SurfSaver button gives three choices: Save, which brings up a dialog box allowing you to create or select a folder in the database to save to as well as the number of levels of linked pages

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and maximum number of pages; Quick-save, which saves the current page to either the last folder used or a default folder (you select which in the configuration page); and Search, which produces another dialog that supports searching the database of saved pages.

Searching under SurfSaver is versatile and fast. Once you have found the Web content you can edit the saved version; go to the "live" URL; and delete, copy or save it as an HTML file.

The cool thing about SurfSaver is that it's free! The penalty you pay is an ad display panel, but this doesn't even exist in many of the displays so you'll find it's easy to ignore.

For \$29.95 you can upgrade to the Pro version, which not only removes the advertising but also supports sharing the SurfSaver databases you create with other users on a LAN as well as allowing you to import HTML and text files directly into SurfSaver folders, making that content also searchable.

This is one of the best utilities we've come across in years and we unreservedly recommend it. Ten gear teeth out of 10!

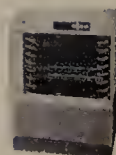
Reviews to gearhead@gibbs.com.



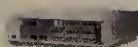
MultiFlow 5000 Multilayer Switch



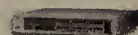
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Management Strategies

Career Development, Project Management, Business Justification

Privacy protector

The new job of chief privacy officer is something you might consider.

BY CONNIE WINKLER

Wanted: Chief privacy officer

Large organization seeks veteran executive with technology smarts to oversee privacy policies, communicate privacy initiatives to employees and customers, and ensure compliance with internal and government privacy requirements. Reports to CEO, COO or senior vice president. \$120,000 to \$180,000, although could go as high as \$250,000. Reply quickly — our job orders are up 300% over last year.

With storage, tracking and sharing of personal information over computer networks on the rise, organizations are formalizing privacy policies with the establishment of the chief privacy officer (CPO) position, says Alan Westin, a privacy expert with the Center for Social and Legal Research.

The total number of CPOs is expected to grow from 100 to 500 by 2002, providing new senior management opportunities for IT pros. Those who assume the title of CPO might network through the Association of Corporate Privacy Officers, a group Westin recently founded in response to the following trends:

- Financial privacy legislation, generally dubbed Gramm-Leach-Bliley, requires every financial institution to communicate their privacy policies to customers by July, and allow them to "opt-out" of marketing solicitations. Federal regulators now evaluate privacy policies as part of their audits for safe-and-sound institutions.
- The Health Insurance Portability and Accountability Act requires almost every healthcare entity to follow strict privacy regulations and have a privacy officer.
- The Children's Online Privacy Protection Act requires that any Web sites targeted at children ensure the children have parental permission to view the site.
- Consumer privacy lawsuits by individuals, classes,

and state attorneys general are increasing. In Minnesota, banks had to pay \$7 million for privacy violations.

- Pending online privacy laws would layer privacy rules on dot-com and brick-and-mortar companies.

"It's not about putting up privacy wallpaper anymore," says Westin, also a Columbia University law professor. "It's now showing that you've got real systems and policies, and that you've done what the regulations require."

Responsibilities

The CPO will:

- Determine, oversee and implement data privacy policies and consumer protection initiatives.
- Ensure the firm adheres to and follows all standards and guidelines as they relate to the organization.
- Work with IT, marketing, sales, legal, human resources and public relations departments to buy-in to privacy policies and actions.
- Educate employees about privacy policies and practices, and build trust with internal groups.
- Respond to customer complaints and questions, and/or be involved with tougher complaints.
- Work with consumer advisory boards.

"You're dealing with laws, with technical issues, with marketing, with training issues. It goes across the company," says Alan Amico about his CPO responsibilities at online auto lender PeopleFirst.com in San Diego. "I didn't appreciate how much time is involved, what a big job it is."

That need to work across functions requires a communicator or negotiator, explains Herman Collins, CEO of Privacy Leaders in San Jose, perhaps the only executive recruitment firm dedicated to CPOs.

At PeopleFirst.com, for example, Amico works closely with CIO Mario Cataldo. "We discuss any

changes in the law or our privacy policies and how that has to be translated into our infrastructure," Cataldo says.

Credit card issuer CompuCredit of Atlanta took a different approach. "CompuCredit wanted someone in the CPO position whom the technologists couldn't easily pull the wool over their eyes with a 'Yeah-yeah, we're doing that,'" says CIO Mark Lawrence, who assumed the added CPO responsibilities. CompuCredit reasoned it was easier to teach a technologist about privacy than a lawyer or public policy expert about technology.

Shelley Harms, executive director of privacy at Verizon in New York, is tackling her latest challenge of creating a single "do not call" list for the entire carrier, which includes the recently merged Bell Atlantic, GTE and Nynex companies.

In her seven years on the job, Harms learned a valuable lesson: "It's very important to build a reputation for doing what you say you will do."

Experience

Consultants and recruiters report a mix of CPO backgrounds — including one private investigator — although for the most part they come from legal and public affairs departments. While in the past they may have been promoted from within, it's now just as likely that they come from the outside.

Ideally, CPOs would also have a combination of legal and technological experience, recruiter Collins says. He's recently been inundated with resumes from intellectual property lawyers betting that privacy will replace dot-coms. That may be the final irony: Many privacy followers believe it was the Internet and dot-com businesses that awoke many companies to the need for a privacy policy and a CPO. ■



DAN VASCONCELLOS

www.nwfusion.com

QUELL CONCERNS

Privacy policy: Verizon's is a frequent benchmark.

Band together: Check out the Association of Corporate Privacy Officers.



Editorial

Say yes to technology, no to people

Recently, I spent time immersed in the RIM BlackBerry culture — testing and writing about the wireless e-mail device. I also read Gil Gordon's new book, *Turn It Off: How To Unplug From The Anytime-Anywhere Office Without Disconnecting Your Career* at the same time.



Although I didn't plan it, the dual exercise helped me gain insight into the often stormy relationship between work and technology.

The premise of *Turn it off* is that we work too hard because we fear losing our jobs through downsizing. Notebooks, cell phones and the BlackBerry let us work nonstop to shore up performance to use against getting canned.

While the book doesn't claim everyone toting a handheld device requires an intervention, a fine series of self-tests will reveal whether you have a problem. If you do, it'll show you how to take back some of that eroded personal time.

While some might be tempted to blame technology for the 24-7 nature of our work lives, it's not the messenger or the message you need to control, but the sender. Turning off or abandoning a device won't lessen the demands on your time. Let colleagues and clients send you all the messages they like. Whether you're free to ignore them on the off-hours is the issue.

BlackBerry devotees I spoke with equate 24-7 connectivity with more control and more freedom. They better utilize their time by reading e-mail while stuck in dead zones (such as in a cab), which frees up in-office time for more important tasks. And for remote workers, the ability to monitor corporate e-mail messages from anywhere decreases anxiety by diminishing the fear of the unknown.

I'm not convinced the idea applies to mobile phones, though. When the phone rings, I jump to answer it like a dog responding to a whistle. On the other hand, e-mail monitoring is passive and secret, and something you control entirely — that is, if you can fight the urge to hit "reply," and have your own turn-it-off strategies.

Speaking of books, I'd like to plug Reading Room, the new section we've added to the Net.Worker Web site (www.nwfusion.com, DocFinder: 3534). *Turn It Off* is one of a slew of books on remote work, small business and related technologies you'll find listed. Over time, we'll read them all and post reviews. Visit often to find which books best address issues and problems faced by Net.Worker readers.

— Toni Kistner
Managing editor, Net.Worker
tkistner@nwfusion.com

Message Queue

SAD ABOUT COVAD

Regarding "DSL service cutoffs may not be the last" (www.nwfusion.com, DocFinder 3522):

I was one of the Internet Express customers Covad cut off with six days' notice and a demand that I pay more money for reduced service and sign a new 12-month contract. Due to this heavy-handed approach, I am now back on a modem suffering DSL withdrawal.

Had Covad been more reasonable, I might still be a customer. But the short notice and 12-month contract at a substantial (90%) increase in price or a dramatic reduction in service was just too much.

Other than that, Covad DSL performed well and worked well with Internet Express. I am sad that things turned out the way that they did.

Richard Barrett
Dallas, Texas

WAKING UP TO CISCO

Regarding Thomas Nolle's column "Just how low can Cisco go?" (www.nwfusion.com, DocFinder: 3523):

I didn't think Nolle had drunk the Cisco Kool-Aid, but apparently some has gotten past his lips. His comment about the industry doing poorly if Cisco does shows shortsightedness. Surely Nolle realizes that Cisco's growth over the past several years has been predominantly via acquisition of market share rather than any innovative product introductions or technology breakthroughs. Cisco isn't even close to being a leader in optical, not because the market doesn't have potential, but because Cisco hasn't been able to acquire or develop industry-leading products. The market is finally waking up to the fact that Cisco isn't the be-all and end-all of networking.

Cisco's problem is partly due to its bet that it could take the service providers away from the incumbents without really understanding their business models and trying to force IP down their throats without a valid cost/benefit analysis, as Nolle notes. The other part of Cisco's problem is that there is only one place to go when you are at the top, and that is down. John Chambers isn't a magician; he's a sales guy and has been good at keeping the momentum

E-mail letters to jdt@nwfusion.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

www.nwfusion.com

MORE ONLINE

Find out what readers are saying about these and other topics.

DocFinder
3521
find it online

going mainly due to his ability to convince people that Cisco can do no wrong. We're now starting to see through the smoke and mirrors, and it isn't a pretty picture.

Debbie Joy
Phoenix

GONE TO FAR

Regarding the article "Active Directory fix to require significant upgrade" (www.nwfusion.com, DocFinder: 3524): Does anyone else think Microsoft

is starting to go too far? Microsoft's introduction of new licensing, new encryption on digital media and policies that dictate upgrades are not optional but mandatory to maintain some semblance of security has convinced me to hop on the Linux train.

Chris Taylor
Atlanta

PLAIN TEXT

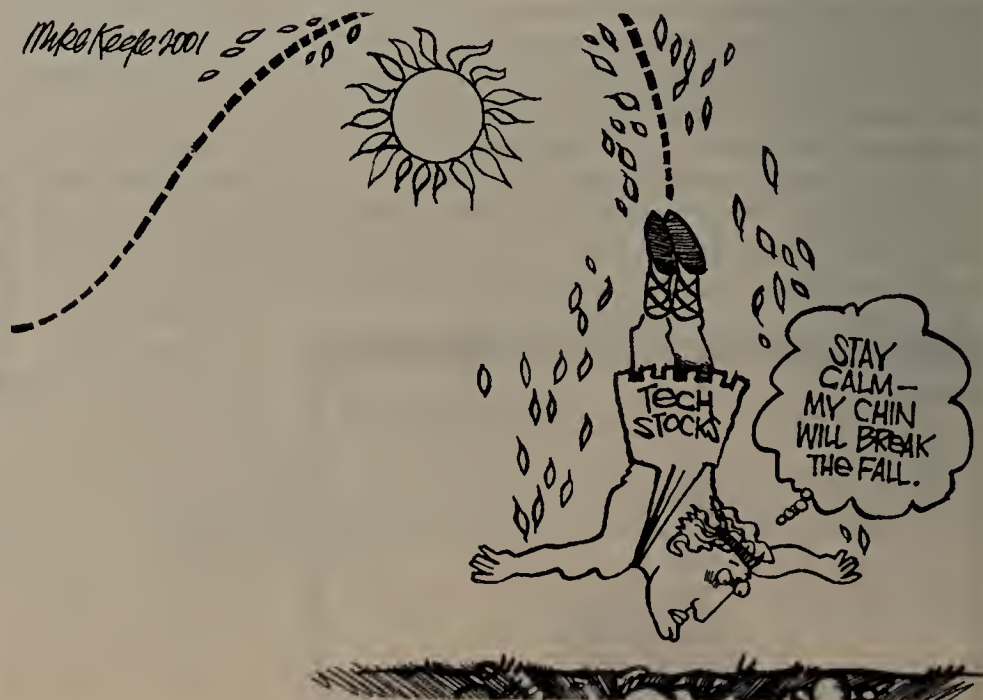
Cheers to Scott Bradner for his column "If you send me mail, make it plain" (www.nwfusion.com, DocFinder: 3525). As a list administrator for discussion lists based on Listserv, Maise and Yahoo, and a member of many lists using other software, I get annoyed at mailing software that uses RTF or HTML as the sender's default. About half my list-related correspondence is teaching people how to use their e-mail programs. The other half is dealing with bounces that can be partly traced to mailboxes filling up from "fat" messages and system traffic caused by viruses.

Liz Marr
Coos Bay, Ore.

NINE, ALL NINE

Your article "AT&T, customers grapple with ATM net outage" (www.nwfusion.com, DocFinder: 3526) mentions that 99.99% network availability is equivalent to 43 minutes of downtime per month. This is actually "three nines" (99.9%) reliability; "Four nines" is 4.3 minutes of downtime per month.

Myron Hollatz
IS coordinator
Minnesota Department of Transportation
Morris, Minn.



SURVIVING A LAYOFF AND LIVING TO TELL ABOUT IT

It was an interesting experience, but one I don't care to repeat. I went to work one day only to find I no longer had a job.

The business unit I worked for focused on the creation and operation of business-to-business digital marketplaces. With the recent downturn in Internet-based technologies and the economic slowdown, business had dropped and corporate management had to make some cuts. And unfortunately, I was one of those cuts.

I can't complain too much in the way of finances. The severance package was very generous and, sensing something bad was coming, a few weeks earlier I had sent my resume to some recruiters and was in the process of scheduling interviews.

However, even though there was no true financial pain, there was a great deal of ego pain. Previously, I had always been one of the survivors. Even though the workload increased, my ego had been stroked by the thought that I was valuable and the company couldn't get along without me. This time, however, I realized that I was no longer valuable and the com-

pany felt it could do very well without me. Strike one to the old ego.

Strike two to my ego came after I left the severance meeting and realized that I was no longer in control — someone else had made decisions about crucial aspects of my life. Someone had decided that I needed to find another job, make arrangements for my 401(k) and find new insurance, that my stock options would never vest, that I needed to go home early and never come back. Instead of being the one directing others, I was now being directed, and the direction was out.

And strike three to the ego — perhaps the worst one of all — came with the awareness that others had known about this decision before I did and steps had already been taken to quickly move me off the premises. During the severance meeting my phone was disconnected, my user ID deleted and my security access taken away. My final paycheck had been printed and was handed to me. A personalized severance package had been prepared and was presented to me. After the meeting, a stack of boxes was wait-

ing at my desk so I could pack my belongings. Corporate human resources personnel had been flown in and were on-site to collect corporate credit cards, security badges and laptops. It was a thoroughly planned process.

Even though everyone — including human resources — went out of his way to be accommodating and helpful, I still felt de-personalized. I was no longer a valued employee, no longer a member of management and no longer one of the team. Call it severed, terminated, downsized or laid off, the result is the same. I was an ex-employee and no longer belonged there.

Fortunately, it didn't take too long to find another job, and once again I am gainfully employed. My ego has been stroked, I am a member of a team, and I am once again valued.

I survived being laid off. I just hope I never have to do it again.

Yoke is an IS manager in Denver. He can be reached at ckyoke@yahoo.com.

SERVICE SWITCHES CAN GET THE INDUSTRY BACK ON TRACK

In a recent column on Cisco's possible future, I mentioned a product classification called "service switches." A few readers have asked what these gadgets are and why they might be useful in building networks.

Our network services today are provided by service networks — networks that speak a specific protocol language and provide a single target service. That's true with voice networks and the

Internet, the two pervasive networks we expect will play a big role in our future. Voice networks use voice switches, and the Internet uses routers. But voice revenue is under pressure, and the Internet isn't even profitable. What

will the profitable future services be, and what will their service networks look like?

We don't know what future services might be, in fact. We have some ideas, but none of them have any real history of proven success. The problem is, holding off building new service networks until we know the answer to the service question would probably kill spending for years. That leads us to service switches.

A service switch is a device designed to link a core network that doesn't have any particular set of service features with a user population that doesn't know exactly what service it wants to buy. Clearly, this is a role that demands flexibility, and that's what these products are designed to produce.

A true service switch would let a carrier use any



form of optical or electrical core network — dense wave division multiplexing, SONET, ATM or IP. In addition, it would let a carrier connect a frame relay user, transparent LAN user, ATM user, Internet user, IP VPN user — you get the idea. Each user would get the service he expects, over the network core the carrier has decided is the best overall buy.

A service switch isn't a router, subscriber management system or any sort of IP access device. It's designed to create only IP services and work with only IP cores. For the same reason, it's not an ATM switch, or a frame switch, either. A service switch is, in fact, a completely new class of device — possibly the first legitimate new hardware product class in years.

Furthermore, service switches are the only type of product that has the potential to pull this industry out of its current nose dive, as far as hardware investment is concerned.

Service switches let carriers deploy networks without having a specific service target, networks that can produce a host of service options all at once with minimal additional cost per service.

That lets carriers try new service combinations and service features without rebuilding the entire network. That, in turn, allows capital investment in networking to move forward even before we know exactly what the killer service of the future — the one that will generate all the revenue we need to get the market back on track — will be.

Service switches have forwarding tables, like routers do. They have switch matrices like switches. They run IP, but not just IP. They connect to optical trunks but aren't really part of the optical wave. They will defy our conventional views of hardware elements, of how network devices are connected and used, and of how the business of public IP services can be made real and profitable.

A dozen little new players make them, and a few industry giants as well. They're all mixed up in the mess of new hardware announcements, just waiting for some clever reader or editor to sort them out of the pack and make them into the unique category they deserve to be.

The concept of service switching is crucial to realizing the kind of networking future we've imagined. This concept will be resisted by many powerful players, and the idea that there might be an entirely new way of looking at networks and services will be uncomfortable to many network customers and carriers as well. But get used to it, folks. The industry will be much poorer — literally — without service switches.

Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J. He can be reached at (856) 753-0004 or tnolle@cimicorp.com.



IDENTIFY YOUR NETWORK *bottlenecks* BEFORE YOUR CUSTOMERS DO.

Your pager flashes 911 – network traffic has come to a screeching halt. How long do you have before the angry mob appears? Six months? More like six minutes.

Can your network management software protect you or, better yet, prevent the problem altogether?

BMC Software's Network Solutions can. And they're so easy to use, you can implement them right away.

That means you can quickly understand, visualize and correct network bottlenecks before the protests begin.

At BMC Software we do one thing – provide solutions to help you make your customers happy.

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Find out more about how BMC Software network solutions can help you. Visit us at www.bmc.com/network/offer to download a **21-day trial**.



Assuring Business Availability™

Network World

A 15-YEAR ROCKET RIDE



When we launched *Network World* in 1986, there were multiple flavors of local networks,

IBM was pushing SNA and LU6.2, e-mail was a kludge, ISDN was the nads, PCs were only good for word processing and 1-2-3, PBXs were being eyed as a way to integrate voice and data, and OSI was going to ameliorate the tremendous compatibility issues plaguing the industry.

So dire was the state of interoperability at the time that an IBM study showed that large organizations needed an average of 16 parallel networks to string together their corporate resources.

Have we solved the world's network problems in the ensuing 15 years? Many of them, but with each step forward we encounter divergent options, and each new opportunity comes with its own set of problems.

So before we take another step, let's reflect on where we've been and how we got to where we are, lest we forget our history lessons and repeat past mistakes.

We'll take our 20-year breather in 2006.

— John Dix

Editor in chief, jdix@nw.com



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Subscribers that have been with us from the start share their experiences.

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Time was networking was for geeks. No longer. Celebrities, politicians and artists talk about how networking has changed their lives.

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How your pay has changed as networking has moved front and center.

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A timeline of network developments.

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Comparing some of 3Com's, Cabletron's and Cisco's oldest products with the gear they sell today.

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Paul Severino not only lived through the major network epochs, but his companies also helped shape and drive them. A Q&A.

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Janet Jackson's song "Nasty" was big in 1986. So was hair. Men favored moustaches. Women, a bouffant. A visual history.

91 LOCATING LEGENDS

Some are hiding under rocks and want to be left alone. But we caught up with a handful of movers and shakers for a quick, "Where are they now?" update.

97 EATING CROW

Let's not forget the flops. Developments chronicled — OK, hyped — in *Network World* over the past 15 years.

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Challenge yourself with this collection of questions about technologies, companies and personalities of the past 15 years.

101 VISION QUEST

Enough with the past. On to the future. We asked some of the most reliable, grizzled and worldly wise pundits to look through our "seer specs" and size up the future.

106 WHAT IF . . .

What if Cisco had made game stations instead of routers? Mark Gibbs kicks back and explores an industry that might have been if things zigged instead of zagged.

ILLUSTRATION: CAPSTONE STUDIOS/JOHN DISMUKES, PHOTO (RIGHT): DAVID STUART

15th Anniversary Online

15 things that changed networking

Boiling it down to a simple list is no easy task. Here's our take. **DocFinder: 3539**

Network World through the years

Log on for a pictorial history of *Network World's* evolution. **DocFinder: 3538**

The Internet

From concept to colossus. A short history. **DocFinder: 3540**

Sounding off

We asked readers to identify the most important technol-

www.nwfusion.com/anniversary

ogy developments of the past 15 years and to postulate about the future. Log on for their feedback and add your thoughts. **DocFinder: 3537**

Going mainstream, Part II

Hear what Kermit the Frog, Adam@Home cartoonist Brian Basset and Mass. Gov. Paul Cellucci have to say about how networking has affected them. **DocFinder: 3535**

Poster child

Have a bare spot on your wall? Download our detailed timeline and get to know the history of the network industry. **DocFinder: 3536**





Nice facade. Bad infrastructure.

INFRASTRUCTURE: SOONER OR LATER, IT MATTERS.

INFRASTRUCTURE. The physical foundation of any thriving enterprise. In the world of technology, infrastructure means integrating the servers, software and storage systems of an e-business into one finely tuned machine. And a well-planned, well-executed infrastructure is the underlying foundation of successful communication, commerce, competitiveness and growth within and among e-businesses everywhere.

To put it simply: as goes infrastructure, so goes the enterprise. In today's economy, all the ingenious products, brilliant marketing and champion deal closers won't amount to a heck of a lot if you can't connect to your outside suppliers, if the network crashes or the databases fail (and all you can say to customers is, "Sorry, the computers are down; can you call us back tomorrow?").

Planning, building and maintaining e-business infrastructure is about hard questions: What platforms should I use? How do I plan for the unexpected? Will it grow when we grow? Will it work with new technology in the future? Will it build

upon my current systems? Can I link to my customers' and suppliers' systems? I've heard about open standards, but what can they do for my business? What about outsourcing? How do I finance all of this?

The people of IBM, together with our Business Partners, help thousands of companies answer difficult questions like these every day. And solve them with flexible, open technologies, such as Linux-enabled servers, and storage systems that scale on a simple, pay-as-you-grow basis. By working with companies such as Cisco Systems® and by using innovative IBM software tools like Tivoli® and WebSphere™, IBM specialists are helping real businesses plan, build and manage infrastructures that are at once both solid and flexible.

So, unless you are able to turn botched infrastructure attempts into fabulously profitable tourist attractions, call us at 800 426 7080 (ask for infrastructure) or visit us at ibm.com/e-business for our latest white paper on e-business infrastructure. The sooner, of course, the better.





Your company thinks
outside the box.

Shouldn't your IT department?

If for every networking need you stack on another box, before long you will have succeeded only in building a costly, inflexible wall. Wouldn't you rather be opening doors to technologies that keep your company moving forward?

Today Service Providers can help you stay focused by delivering and managing the strategic business services that you want, when you want them, from their networks to yours — without any equipment to buy or maintain.

Through CoSine Communications' IP Service Delivery Platform, you choose from an array of market-leading application services — including VPN, firewall, anti-virus and Frame Relay integration. Best of all, the CoSine solution allows you to monitor and change your services at any time. This gives you all of the control over your network without any of the management headaches.

We've removed the walls. You're now free to expand your business. To discover more about CoSine's solutions or to find a CoSine-powered Service Provider, call 1-866-226-7463 or visit www.cosinecom.com



The Next Wave in Carrier Services

OLD FRIENDS

Loren Wagner

Then

Title: Computer systems administrator

Employer: Cooper Tire & Rubber Co.

Job duties: Supported the mainframe systems. Also responsible for data communications, which evolved into networking and network security. Shared responsibility for disaster recovery.

Computer/network environment: Distributed mainframe. Centralized financials, ordering, billing, production planning and inventory control. Beginnings of PCs on the desktop, still mostly terminals. Networking just emerging.

Now

Title: Manager, network services

Employer: Cooper Tire & Rubber Co.

Job duties: Responsible for telecommunications infrastructure at the company headquarters. Coordinate international WAN design activities and vendor contract negotiations. Share responsibility for Internet connectivity, security, monitoring and reporting. Chair the Network Services Team, which is responsible for defining standards, procedures and appropriate technologies.

Computer/network environment: Fewer mainframes. Servers run rampant. Terminals used as point solutions, PCs on the desktop very prevalent. Still centralized financials, ordering, billing, production planning and inventory control. Almost everything is networked. Proprietary protocols almost nonexistent. TCP/IP has evolved to be the protocol of choice.

Opinions

The most significant industry event of the past 15 years: Introduction of the World Wide Web. Few things have contributed so much to bring the rewards of IT to the masses.

The most significant technology development of the past 15 years: The sheer growth of and our dependency on networked systems of all types.

One technology you thought would make it but didn't: Manufacturing Application Protocol. At the time, and given the support of some very large companies, I thought they would find a way to make it a success.

One technology you thought wouldn't make it but did: Biometrics in the mainstream. Certainly not infallible but appears very promising.

Proudest network achievement: Leading the Network Services Team. Established almost 10 years ago, it has become the catalyst for recognizing the business needs for networking technologies and the forum for communicating those needs throughout the organization. We have made a conscious effort to make technology a facilitating rather than an inhibiting influence.

Worst network disaster: A nasty lightning strike hit our manufacturing plant in 1996. The electrical impulse followed a copper path back into our PBX room, taking out a major portion of our voice and data services. It was nearly 24 hours before critical services were restored and three days before most of the damage was repaired. The severity of the damage was due largely to inadequate protection and grounding in some areas. The positive side is that it was a wake-up call for many.

We tracked down a handful of subscribers who have been with us from the start in 1986 and asked them where they came from, where they are today and for their thoughts about milestones along the way.

Jim Kerlin

Then

Title: Director of automation headquarters, Military Airlift Command; Colonel

Employer: U.S. Air Force

Job duties: Supervised 520 personnel who provided automation support to the Military Airlift Command for 35 locations worldwide. Responsible for the development and maintenance of 2,500 unique applications running on \$60 million worth of mainframe, mini- and microcomputer systems with an annual operating budget of \$80 million.

Computer/network environment: Ethernet, TCP/IP, Xerox Star

Now

Title: Director of Education Outreach Services, Center for Education Technology

Employer: Pennsylvania State University

Job duties: Technology in teaching/learning liaison with faculty, students, campuses and colleges. Also, instructor in the Department of Computer Science and Engineering.

Computer/network environment: FDDI, ATM, TCP/IP, AppleTalk, Ethernet and token ring.

Opinions

The most significant industry event of the past 15 years: The emergence of industries that have evolved into significant providers of IT resources. For example, virus protection software, Linux, handheld devices and PC manufacturers.

The most significant technology development of the past 15 years: The evolution of

the Internet.

One technology you thought would make it but didn't: The evolution of the paperless office.

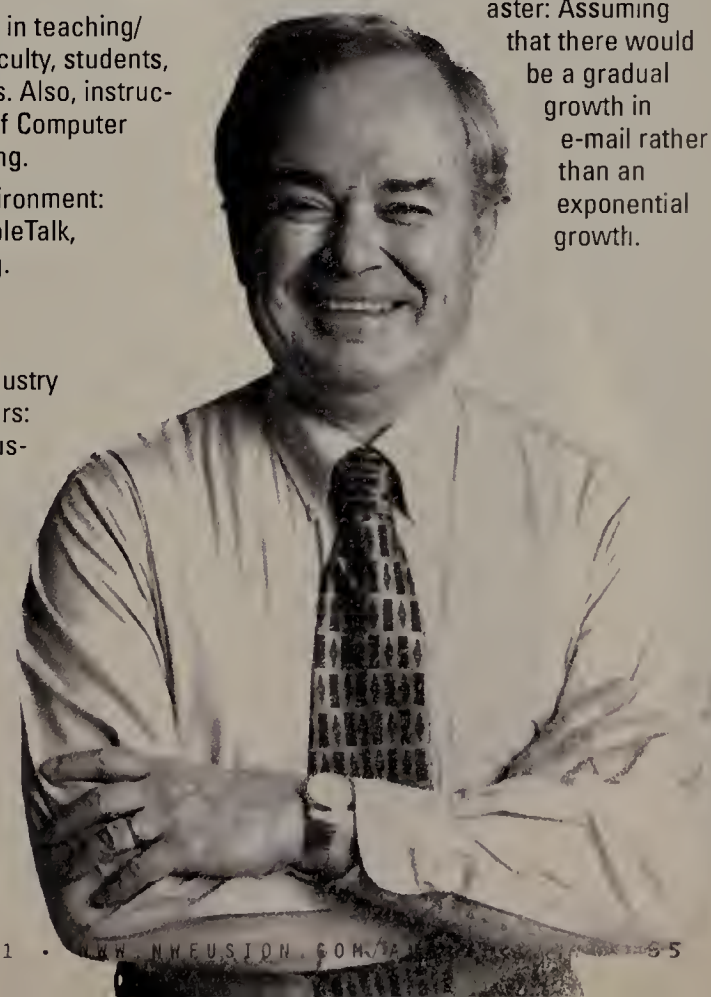
One technology you thought wouldn't make it but did: Voice recognition seemed a far-off dream. However, significant advances in software over the past five years indicate that in the first decade of the 21st century, voice recognition will be replacing many manual data entry systems.

Best technology decision you made in the past 15 years: Replacing mainframe computers with networks of PCs.

Worst technology decision you made in the past 15 years: Assuming that computer technology would become so user-friendly that people could teach themselves by logging on to the Internet for tutorials and help.

Proudest network achievement: Early use of an Ethernet network using Xerox Star computers.

Worst network disaster: Assuming that there would be a gradual growth in e-mail rather than an exponential growth.





Arne Francis

Then

Title: Manager, data center operations

Employer: Paramount Pictures

Job duties: Computer operations manager for 24-7 data center. Responsible for shift leaders, computer operators, I/O clerks, network management, batch processing schedules, online systems and help desk.

Computer/network environment: IBM 3090 mainframe with a simple SNA network that connected the CPU in New York to the interactive users and programmers at the Paramount Studio in California. Also, a few Wang VS6 minis for word processing.

Now

Title: Network analyst

Employer: J.P. Morgan Chase

Job duties: Design, implement and support corporate client network connectivity for the treasury services business. Currently involved in convergence projects, SNMP network management and designing a client extranet.

Computer/network environment: IBM mainframe, Unix, Windows NT, Windows and others. Network operating environment is SNA/SDLC, TCP/IP, NetWare and others.

Opinions

The most significant industry event of the past 15 years: The adaptation of the Internet for commercial purposes and e-commerce.

The most significant technology development of the past 15 years: The development of the PC and the spawning of the software industry. This engaged all company employees in productivity, creativity and development.

One technology you thought would make it but didn't: DSL. Hasn't made it yet.

One technology you thought wouldn't make it but did: IP telephony.

Proudest network achievement: At the time, getting TCP/IP to work on a mainframe and building the first IP network connection to a client.

Worst network disaster: The infamous backhoe cable cut in Chicago. Learned what route diversity really means and the value of a solid dial back-up plan.

Robert Denison

Then

Title: Lead systems programmer

Employer: Wausau Insurance

Job duties: Responsible for various word processing and distributed system initiatives. Set personal computer direction and strategy.

Computer/network environment: An IBM mainframe for core insurance applications. Distributed IBM 4300s for data entry. Wang and IBM system for word processing. IBM PCs and 3270 terminals to access mainframe and distributed systems. Point-to-point lines linking our major offices over an SNA network. Our LANs were token ring.

Now

Title: Principal software engineer

Employer: Wausau Insurance/Liberty Mutual

Job duties: Acting as a systems architect and systems integrator for various Web and business-to-business initiatives.

Computer/network environment: IBM mainframes, AIX/Solaris/NT distributed servers and Windows 95 desktops connected via a TCP/IP network. The LANs are composed of primarily 10 and 100Base-T Ethernet. The WAN is composed of frame relay, ATM and dedicated services. Some business-to-business and business-to-consumer through the Internet, using Secure Sockets Layer 3 or VPN to protect sensitive data.

Opinions

The most significant industry event of the past 15 years: The widespread acceptance of the Internet. This has become the killer application, driving millions of people to lose their fear of technology.

The most significant technology development of the past 15 years: The continuing enhancement and cost reduction of microprocessing technology, enabling all other technologies.

One technology you thought would make it but didn't: ISDN — before it achieved full geographical penetration, it was surpassed by superior technologies.

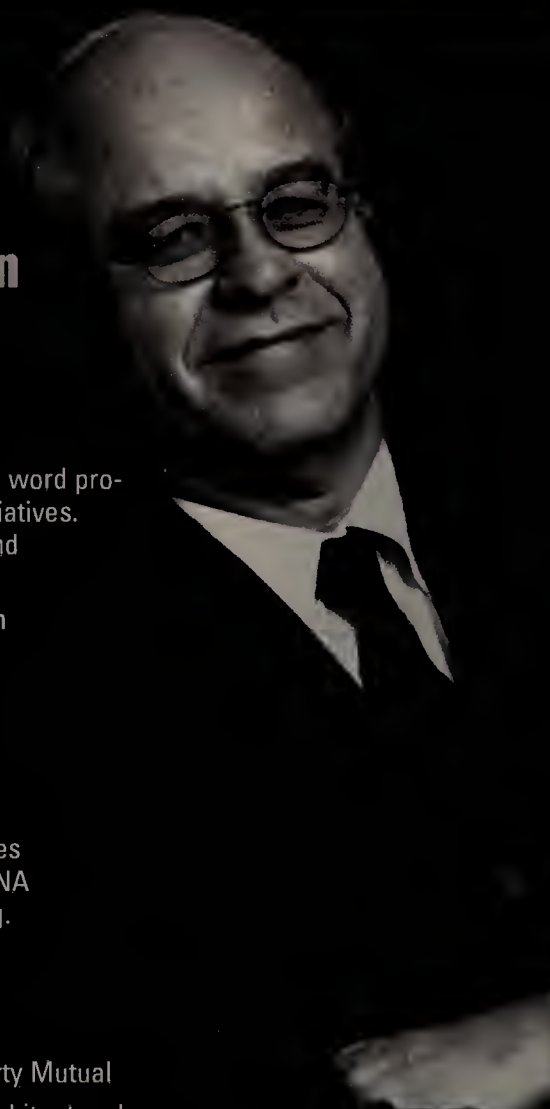
One technology you thought wouldn't make it but did: Microsoft's suite of office tools becoming the de facto standard.

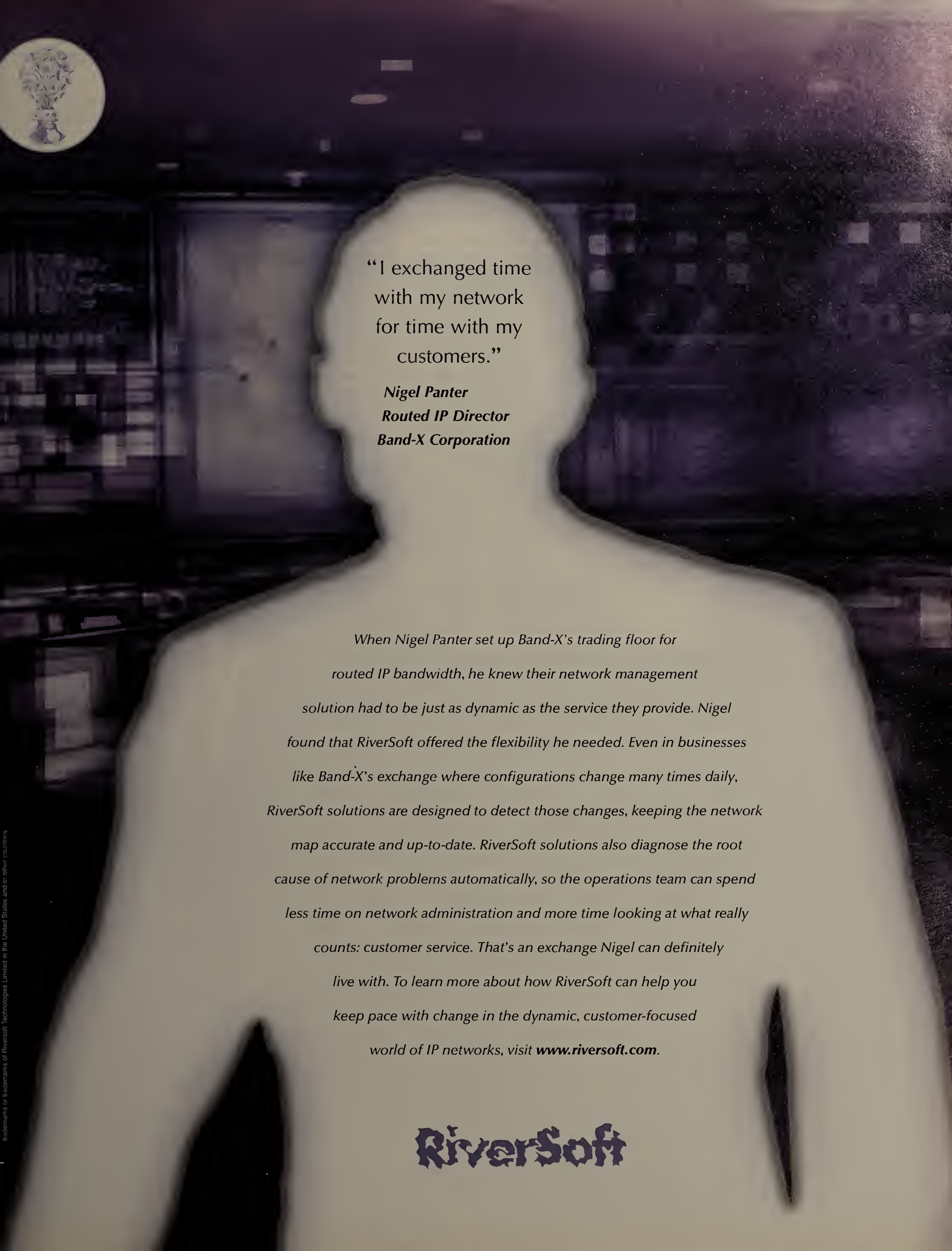
Best technology decision you made in the past 15 years: Standardized on TCP/IP networking.

Worst technology decision you made in the past 15 years: Attempted to implement a lowest-cost Ethernet switching solution for our Home Office LAN.

Proudest network achievement: Implemented a full-function Internet-enabled customer service site, seamlessly integrating new Java, client/server and legacy mainframe applications. Implemented single sign-on to five different security systems. Used remote-control servers to enable the client/server applications. Used VPN to securely deliver these technologies through the Internet and a variety of customer firewalls.

Worst network disaster: We've built in a lot of fault tolerance and been lucky to avoid any major disasters.





"I exchanged time
with my network
for time with my
customers."

*Nigel Panter
Routed IP Director
Band-X Corporation*

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live with. To learn more about how RiverSoft can help you
keep pace with change in the dynamic, customer-focused
world of IP networks, visit **www.riversoft.com**.*

RiverSoft

Dan Williams

Then

Title: Senior data communications analyst

Employer: CF, Inc.

Job duties: Responsible for WAN design and provisioning projects, establishing network disaster recovery options and managing the growing expansion of international network services.

Computer/network environment: Primarily an IBM host mainframe. Low-speed (4800 bit/sec) multipoint circuits typically shared by 10 offices and tied to a regional answering service office where we located our remote multiplexers. IBM's BISYNC (3270) and SNA/SDLC were the predominant transport protocols.

Now

Title: Senior manager, telecommunications & engineering services

Employer: CNF, Inc. (successor to CF, Inc.)

Job duties: Responsible for enterprisewide voice, data and wireless services. Biggest challenge is leveraging the combined buying power from a corporate perspective while tailoring telecom and network services for independent operating business units.

Computer/network environment: Primarily a host-centric (IBM) database and application environment. We do little distributed computing. The network is frame relay to ATM using TCP/IP. Support SNA devices through Data Link Switching on the frame relay links.

Opinions

The most significant industry event of the past 15 years: The advent and proliferation of the Web.

The most significant technology development of the past 15 years: The expansion of fiber bandwidth technologies as a result of wave division and dense wave division multiplexing.

One technology you thought would make it but didn't: Wireless local access (bypass). I'd still like to see some "real" competitive pressure in the local access arena, but it's just not there yet.

One technology you thought wouldn't make it but did: xDSL — or at least it appears that it might make it.

Best technology decision you made in the past 15 years: Selecting Newbridge T-1 multiplexing technology to deploy in a nationwide private backbone network. After 10 years with no major outages (and less than 10 component failures), we are now decommissioning the equipment.

Worst technology decision you made in the past 15 years: I thought we might use some ASYNC multiplexing technology to support our growing DEC/VAX applications back in 1990 and bought 16 units that never got out of the box.

Proudest network achievement: Deploying, with the help of a co-worker, the nationwide Newbridge backbone ahead of schedule and under budget.

Carl Jackson

Then

Title: Telecommunications analyst coordinator III

Employer: Great American First Savings Bank (San Diego)

Job duties: Designed, ordered and implemented data networks. I also developed, wrote and supported a work order and trouble report tracking system on VM/CMS for telecommunications-related work/troubles.

Computer/network environment: Approximately 205 branches with more than 3,500 terminals. Multiple IBM mainframes, 3270 protocol, point-to-point and multipoint 2,400-9,600 bit/sec analog-leased lines.

Now

Title: Network infrastructure supervisor

Employer: East Bay Municipal Utility District (Oakland, Calif.)

Job duties: Manage and supervise a staff of seven who manage, install, repair and monitor computer networks, voice systems and wireless communications.

Computer/network environment: IBM mainframe and DEC/VAX for legacy applications, three Hewlett-Packard platforms for Oracle databases and applications, 20-plus Novell file servers, five Microsoft Exchange e-mail servers, numerous Web servers. LAN backbone is full-duplex 100Base-T over fiber, while desktop connections are 10Base-T Ethernet. WAN is point-to-point T-1 and T-3.

Opinions

The most significant technology development of the past 15 years: Open Systems. We all know what this did for networking. No more dual networks, and communications equipment is easier to install, easier to maintain and easier to troubleshoot.

One technology you thought wouldn't make it but did: Open Systems! I had my doubts about this when I first became aware of what the International Standards Organization was talking about in the 1980s. What dreamers! No more proprietary protocols? Yeah, right!

Best technology decision you made in the past 15 years: Moving to a routed network.

Worst technology decision you made in the past 15 years: Although it was the "best" way to do it when we started in the early 1990s, a "bridged" WAN was nothing but trouble when traffic was at its peak.

Proudest network achievement: Installing the right tools for the job. Having the right monitoring hardware and/or software and the proficiency to use it to identify problems is invaluable.

Worst network disaster: Backbone router failure in the mid-'90s. Three days of outage, companywide. This caused us to reevaluate manufacturers, leading to our current platform.

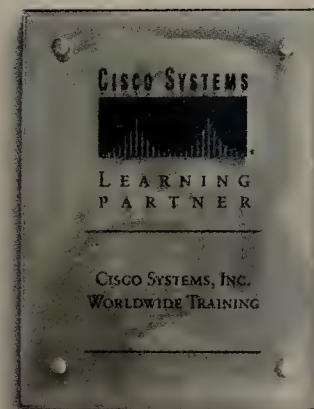
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ILLUSTRATION: BARRY BLITT

▲ SAM DONALDSON

Veteran newsman Sam Donaldson, who co-anchors "20/20" and "This Week with Sam Donaldson and Cokie Roberts" on ABC, was quick to recognize the value of using the Internet to reach a large audience. He now hosts SamDonaldson@abcnews.com, a daily Webcast that has touched on issues from the Metallica vs. Napster copyright battle to the 2000 Presidential Campaign. He has also interviewed newsmakers such as professional wrestler The Rock, U2's Bono and former Secretary of State Madeleine Albright on this Internet-only show.

"I was oblivious. I got my first computer in 1996, and that's

late according to the experts. But that's not as bad as a certain former president [Bill Clinton] who still can't type! When that furor started with Col. [Oliver] North and e-mail was erased . . . at the time I thought: What the hell is e-mail?" he says.

"So you ask how come I'm doing this? I mean, I'm in the twilight of my career. I've really gotten hooked on this. I recently had on Jack Hemingway, Ernest Hemingway's grandson, who read some of Ernest's works. I never could sell this to the producers of "20/20."

"I believe in the future, everything will go on the Internet, including television. There won't be anymore television affiliates as we know them — you'll have ABC News on the Web. How far

out? It could be five years, 10 years, I'm not sure, but it will happen. . . . It's shrinking the world. Before, I would go on the telephone to call Hong Kong, and now with the Internet I can do that even quicker. I don't have to dial 12 numbers to talk to my buddies. I can do it in 10 seconds," he adds.

"But I think where the Internet will impact society is in a political sense. A dictator can't have a closed society. They would have to do away with electrical power. They're not going to keep people, who live to the age of 37, from the world of goods and services. They're going to demand to have a share of these goods and services. The societal impact of the Internet will level the world."

► SCOTT ADAMS

Scott Adams is the man behind "Dilbert," one of the high tech community's favorite comic strips. One of the first cartoonists to publish an e-mail address in his strip, Adams says "Dilbert" probably wouldn't be the same without the Internet and its ability to keep him in close contact with his fans.

"The first thing that occurs to me about the Internet is that it's much harder to be full of crap," he says. "Recently I was at

GOING

MAIN

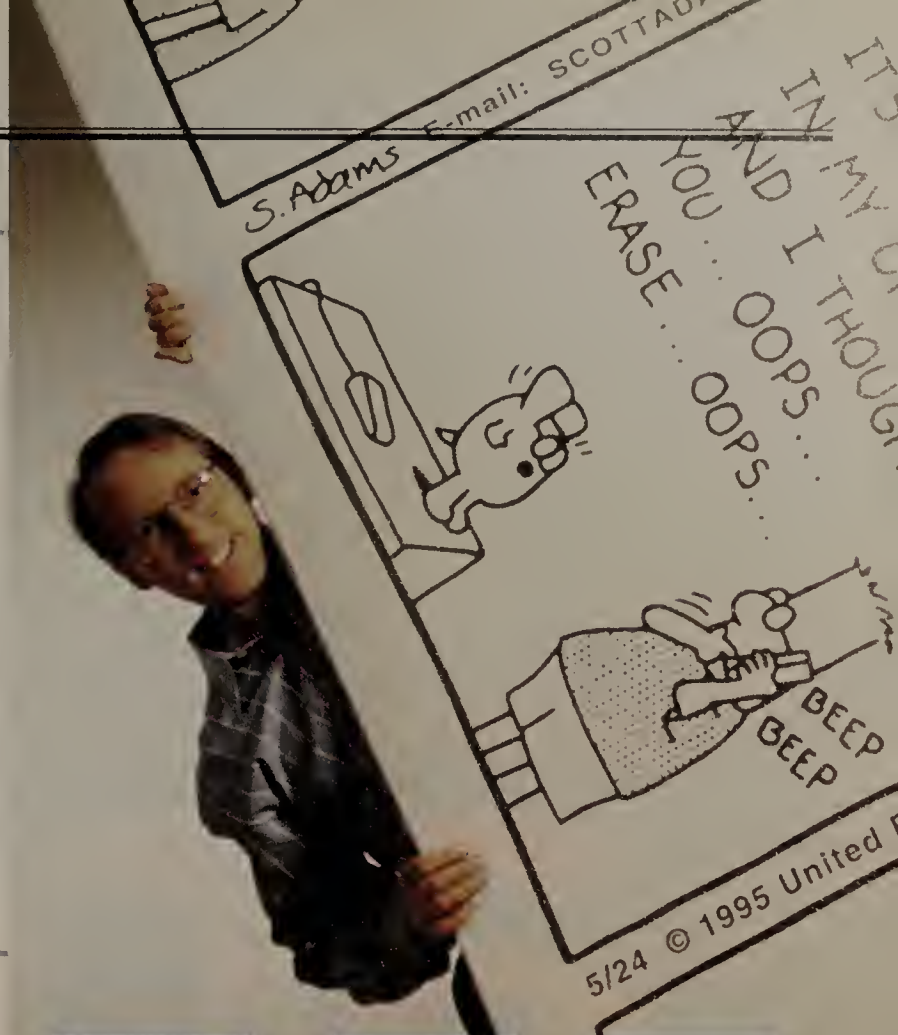
By Jennifer Mears and Kathleen Ohlson

There was a time when networks were for geeks. No more. From cartoonists to quarterbacks, politicians to pundits, and anchors to editors, it seems as though almost everyone is hooked into networks these days. Here are a handful of high-profile individuals who make time to log on and share their views about what the Internet has meant for them and what it will mean to the world at large.

party where we got into a discussion about what percentage of the world's religions were Christian vs. Islamic [and others]. And everybody had a strong opinion. But within two minutes of Web searching, I had an entire printout that I could mail to everybody. It's just beautiful to be able to settle arguments like you never could have done before," he says. "I mean, my life has just been transformed by it. I literally have a computer at my right hand and one at my left. I had a special desk designed so I could

have a Mac on the right and a Windows machine on the left. ... The Internet made the comic strip literally interactive. I'm getting mail today that will shape the cartoons that I do tomorrow. That, plus my Web site, really just transformed the strip. "One of the things that has occurred to me recently is that virtually every service I use and every product I buy is never exactly what I had hoped it would be before I bought it. And I asked myself what will happen when I can get all the information I need on products from

the Internet before I buy them. And I think the answer is I wouldn't buy three-quarters of the things I buy," he adds. "So I'm wondering if the Internet will destroy civilization as we know it because so much depends on, for example, having four major car companies. But what happens when anybody can get on the Internet and find out which of the models in their price range is simply better in every way? People buy stuff because they don't know any better. What happens when everybody knows better?"



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Kermit the Frog, Massachusetts Gov. Paul Cellucci and cartoonist Brian Basset expound on the 'Net.

www.nwfusion.com/anniversary



◀ MIKA SALMI

Remember when you were younger and you got your hands on your parent's film projector? Maybe you filmed your adventures with the hopes of some day becoming the next Alfred Hitchcock, Orson Welles or Steven Spielberg. Well, those wanna-be filmmakers got their wish in 1998 when Mika Salmi founded AtomFilms, an Internet entertainment company that lets independent filmmakers and animators submit their works, and lets Web users download short films and animations.

"The Internet has provided our society with a forum for

sharing and exchanging creative ideas, technologic advancements and information. No other medium to date has given people so much 'power' in terms of interaction and communication," he says.

"One example, coming from the Atom side of our newly merged company, Atom/shockwave, is our ability to bring filmmakers together with their audience, with one-to-one interaction through rating and review channels, providing instant feedback to the artist about their film or animation.

"More importantly, the 'Net has provided independent filmmakers and animators with a platform to showcase their talents to a worldwide audience.

Up until now, many of these same artists were without promotion or distribution outlets — hence no one was able to see their work. The Internet has changed all of that for artists, even outside of film," he adds.

"The Internet helped AtomFilms become a brand name for short-form entertainment by providing us with the channel to put shorts in front of millions of people, and in essence resurrecting independent shorts as more of a recognized art form. Atom/shockwave will continue leveraging the Internet for promotion and distribution of short films and animations as well as games and other entertainment."

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SEN. MARIA CANTWELL

A former senior vice president of Real Networks, Sen. Maria Cantwell (D-Wash.) has been in the thick of the dot-com revolution. She joined Real Networks in 1995 after one term in Congress, overseeing the release of RealAudio and several other digital media products. Now Cantwell is back in Washington, D.C., after using some of her dot-com earnings to help fund her campaign to win the recent election.

"Nothing symbolized the tremendous growth in network technologies over the last decade more than the Web," she says. "Yet all network technologies share a common theme: The innovations of the 1990s gave individuals more control over and more choices in their daily entertainment, work and communications activities. The popularization of the Web browser and associated rich media applications created a mass medium that allows individuals to experience entertainment, news and information from around the world. Established news agencies and corporate entertainment entities are on equal footing with amateurs and independent programming sources."

"Looking forward, the key technology advancements of the 21st century will likely share the same themes as those of the 1990s. Digital video recorders will allow people to select and watch TV programs on their own

schedule. Digital music devices allow people to easily take their music collection with them when they leave their home.

"The government will play an important role in ensuring that

consumer protections are in place and new technologies aren't exploited, whether that means protecting personal privacy or copyrighted content. The most important role the government can play, however, is to support sound fiscal policy to keep the economy strong and to invest in the development of technology skills in our youth to provide the next generation of high-tech workers."

STEVE YOUNG

Former San Francisco 49ers quarterback Steve Young is no stranger to the Internet and networks. Young is chairman of Found, an e-business service

provider, and is a board member for network equipment maker Foundry Networks. He has a personal Web page for football fans and has done Webcasts for his children's foundation, Forever Young.

"The best thing you can say about the Internet is that it's leveling the

playing field for everybody," he says. "I'm really excited about what it can do for education. It's brought great efficiencies from top to bottom in everybody's lives. And it's just beginning to be understood."

"We're in the second or third inning of this thing. Think about broadband.

Think about the possibilities of delivering information to your home. We're going to think these were the archaic days, especially in education.

"The way that we go to school is going to change dramatically once we get the broadband delivery of content. My dream is to be able to deliver K-12

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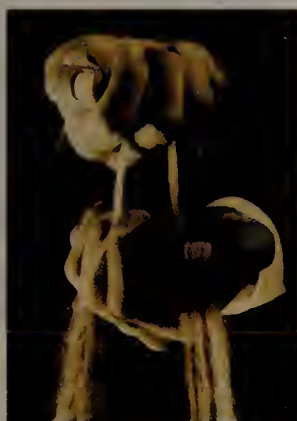
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educational content around the world for free. One of the biggest costs in education is infrastructure — the bricks and mortar to build a school. We've thought it through where all you need is the generator to power the laptops every night and download from the satellite, and you've got a school," he adds.

"Access to computers is going to become ubiquitous at some point. I'm convinced that in the near future, having a laptop or the ability to connect to the Internet will become more and more available.

The Internet gives me the ability to have another place to interact. It's great because you can write a message

and everyone can get [it]. If you're a 49er fan living in New York, suddenly there's some way to have an outlet to talk about the 49ers."

► MICHAEL KINSLEY

Michael Kinsley moved from print

media to online media, launching *Slate* in 1996 and serving as its editor. Prior to joining the Internet world, Kinsley served as senior editor at the *New Republic* and co-host of "Crossfire."

"I've seen the impact of the Internet in my writing," he says. "I tend to do document-based reporting rather than interview people. I'm better off in Redmond than I was in the heart of Washington, D.C., five years ago. I now can procrastinate until Sunday evening."

"The Internet has given me the possibility to have a magazine due to two things: The promise of the economy where you don't have to pay for printing and postage, and it's a hot property for someone like me, or me. Every journalist wants to start their own magazine, and they're told: 'It sounds like a great idea, but we're not going to fund it.' In the golden days of the late 1990s, they were willing to back you.

"Shopping has and will be transformed; reading has and will be transformed. Personal financing — the idea of writing a check will be a joke. Entertainment will be interesting. When the TV was invented, people thought: 'Why would anyone go to movie theaters?' People continue to go to movie theaters. Gosh, education ... it will seem absurd to go to a huge lecture hall to listen to some guy talking usually on his schedule," he adds.

"Bottom line, the hype is true in every aspect. ... Politically, it's unclear what the impact will be. Everybody was geared up for the 2000 presidential campaign to be the 'Internet election.' There wasn't much to say [in] this election about the Internet, even with the guy who invented the Internet.



"Personally, I thought the impact with e-mail was terrific, but I started having my doubts about a year ago. Suddenly a convenience turns into a flood. Something's changed in the past year. There's no sign of a filter doing the job, somebody's got to invent it. ... If you have the best of talking and the best of writing, then it's a great way of communication." ■

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As networking grows in importance, so do the salaries of its professionals.

NETWORK SALARIES, THEN AND NOW

By Joanne Cummings

In 1985, George Bush was vice president, the Cold War was raging, and the typical manager of data network services made a base salary of \$54,800.

Today, George W. Bush is president, the Cold War is over, and that same manager's salary has more than doubled to \$114,700, according to annual surveys conducted by Edward Perlin Associates, a New York IT management consultancy.

When stock and other incentives (nonexistent in 1985) are added, the total compensation package comes to \$153,500, on average (see graphic below).

Managers of data networks have seen their salaries grow much faster than telecom network managers' have during the past 15 years. In 1985, the telecom folk had a base salary of \$52,200, quite comparable to the data network manager's \$54,800. By 1995, data net managers were earning \$94,800 in base salary, while the telecom people were only up to \$79,700.

Today, that gap is even larger — \$114,700 for the data network manager to \$86,600 in base salary for the telecom manager. And when cash bonuses and stock options are factored in, the data network folk are earning \$153,500 vs. \$106,300 for the telecom people.

At the high end, top IT executives, who in 1985 were not yet called CIOs, made an average base salary of \$137,900, which bumped up to \$221,600 when cash bonuses were included. By

1995, the average CIO was making double that — \$435,600 in salary and bonuses.

And when stock options became part of the compensation package, CIO compensation went into the stratosphere. In 2000, the average CIO made nearly \$900,000 when stock options were added to a base salary of \$306,500 and more than \$200,000 in bonuses. Of course, those stock figures may look quite different at the end of 2001.

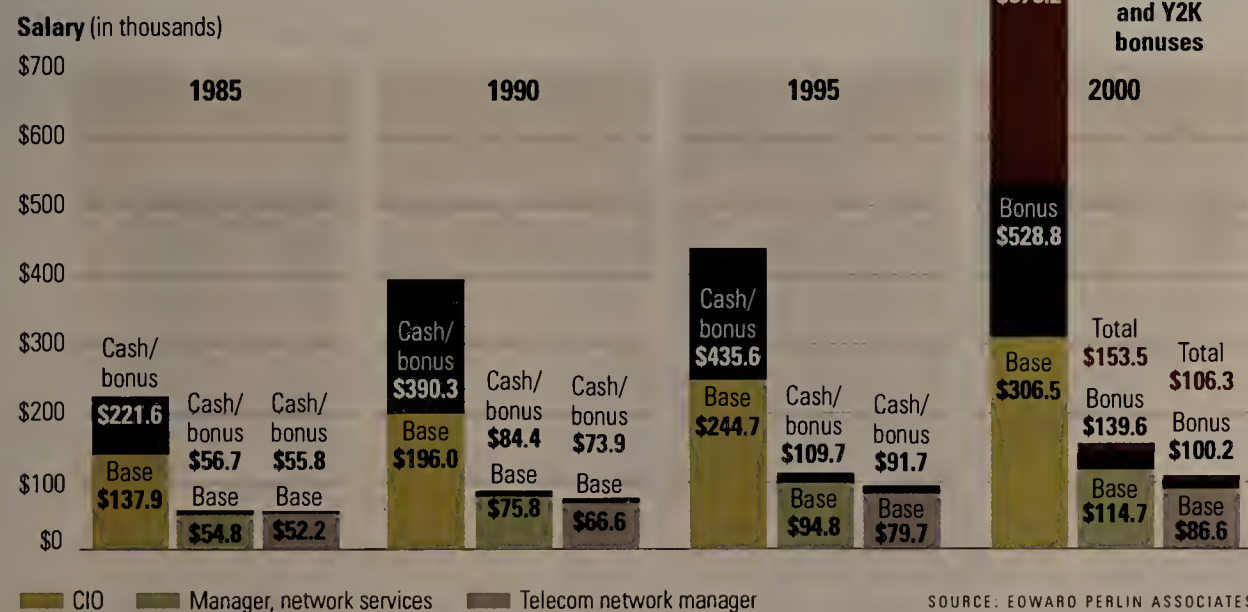
Skills: Then and now

In the April 21, 1985, issue of *The New York Sunday Times*, General Electric's Consulting Services in Piscataway, N.J., placed a classified ad looking for savvy "data processing" professionals, with expertise in Unix/C, X.25, SNA, compiler design, transaction processing and systems administration, plus a minimum of five years' experience in VAX/VMS; microprocessors; Assembly, Pascal and Fortran; message switching and telephony; as well as systems integration, system reliability engineering, and simulation/conversion/queuing skills.

In the Jan. 28, 2001, issue of *The Boston Sunday Globe*, a Boston.com ad was looking for a director of technology, with technical proficiencies in Perl, JavaScript, HTML, (DHTML/CSS), XML, C and relational database development and management; plus experience with Apache and Netscape Enterprise servers, Linux and Solaris operating systems, and Netgravity and RealMedia ad serving technologies.

NETWORK PROFESSIONALS' SALARIES, then and now

Figures are based on annual surveys of approximately 4,500 IT professionals at about 200 U.S. companies. (CIO figures for 2000 based on 53 respondents at large companies.) Total package numbers, which were not gathered until 1998, include base salary, cash bonuses and long-term offerings such as stock options. For more information, contact Edward Perlin Associates at (212) 714-0588.



Benefits: Then and now

The benefits for GE's 1985 job are fairly straightforward when compared with today's job ads. GE offered tuition reimbursement for work-related courses, something that seems a bit ahead of its time in comparison with other ads run that year. In addition, the firm offered "diverse projects, along with company-paid insurance, and the security of knowing you're keeping company with the best."

A 2001 job ad for Optical Switch starts out with the lines: "First day on the job and you're already the proud owner of a nice piece of pre-IPO stock options. Not to mention your whole family has free medical and dental coverage."

Cummings is a freelance writer living in North Andover, Mass. She can be reached at joanne_m_cummings@hotmail.com.

PUTTING IT

A TIMELINE OF NETWORK DEVELOPMENTS

By John Dix



1986 Ethernet interface cards for VAXes cost \$3,200.



Oct. 1988 3Com ships 3+Open, the first network operating system based on Microsoft's LAN Manager. Digital Equipment and the X/Open consortium join the ranks of LAN Manager supporters.



1987 AppleTalk introduced.



Aug. 1988 MCI celebrates 20th anniversary.



May 1986 Wang acquires PBX maker Intecom for \$156 million.

Nov. 1987 Unisys acquires mux maker Timeplex for \$350 million. Sells it for \$207 million in June 1993 to Swiss giant Ascom Holdings.

Aug. 1987 Bridge, 3Com merge.



Feb. 1989 Ark Electronics advertises a 19.2K bit/sec modem in *Network World* for \$3,595, a huge improvement over the dollar/bit cost of modems in the early 1980s.

Dec. 1990 AT&T makes \$6.12 billion hostile take-over bid for NCR. Deal is finalized in May 1991.



WILLIAM ESREY, CEO, SPRINT

Sept. 1990 Microsoft, IBM split on OS/2 and Windows development.

May 1989 AT&T fractional T-1 services hit the market.

July 1990 Compaq rolls out 80486-based SystemPro 486 server.

Dec. 1990 Wellfleet and Cisco add support for IBM's SDLC protocol to make it easier for users to construct multiprotocol backbones.

Dec. 1990 3Com exits the network operating system market because of disappointing sales of 3+Open, which is based on Microsoft's OS/2 LAN Manager.



Feb. 1993 Paine-Webber signals an industry shift by cashing in its IBM SNA network, front-end processors and cluster controllers for a TCP/IP net based on LANs, routers and frame relay links.

Sept. 1992 Cisco offers Advanced Peer-to-Peer Internetworking (APPI) as an alternative to IBM's Advanced Peer-to-Peer Networking to combine SNA peer-to-peer routing with TCP/IP features. Cisco abandons APPI 11 months later.

May 1993 Microsoft formally announces Windows NT at Comdex/Spring in Atlanta.

March 1994 Bill Gates and Craig McCaw file plans with the Federal Communications Commission for a massive, low-orbit satellite venture called Teledesic.

April 1994 Yahoo is founded by two Stanford doctoral candidates.

1986

1991

April 1987 Microsoft and IBM introduce OS/2; Microsoft announces LAN Manager, a network operating system that will compete with Novell's NetWare.

April 1987 IBM unveils the PS/2 family of PCs, including models based on Intel's 8086, 80286 and 80386 microprocessors.

1986 IBM Netview introduced.

1986 McDonald's is first to trial ISDN.

Feb. 1988 Tandem wades into LAN market with buyout of Ungermann-Bass for \$260 million.

April 1988 Illinois Bell files the country's first general tariff for ISDN.

April 1988 AT&T becomes first carrier to offer ISDN Primary Rate Interface LAN.

May 1988 Fire in Illinois Bell's Hinsdale central office damages most of the 50,000 circuits supported by the switch.



March 1989 Tim Berners-Lee of the European Practice Physics Lab proposes the World Wide Web.

Feb. 1990 Cisco goes public. Revenue will grow 40% per year for every year through 2000 except for 1998, when it only grew 31%.

Oct. 1989 Net Frame ushers in the super-server era with introduction of the first "network mainframes."

Feb. 1991 AOL adds support for IBM-compatible PCs.



Oct. 1991 Linux kernel released.

April 1990 Lotus, Novell announce plans to merge in a stock swap valued at \$1.5 billion. They call it off one month later.

Oct. 1992 Start-up Grand Junction reveals it is developing a 100M bit/sec version of Ethernet that will use unshielded twisted-pair wire.



April 1994 Robert Frankenberg named CEO of Novell, replacing Ray Noorda, who two months later steps down as chairman.



Dec. 1988 IBM sells its Rolm PBX Division to Siemens AG. IBM had acquired the PBX maker in 1985 for \$1.5 billion and was said to have lost \$100 million in the first six months of '88.



STEVE BORNA

Feb. 1993 Marc Andreessen introduces Mosaic, the first graphical browser, while working at the National Center for Supercomputing Applications.

June 1994 Bell Atlantic becomes the first regional Bell holding company to tariff a public ATM service.



ILLUSTRATIONS: BARRY BLITT

THE LINE

June 1994 After five years of development, the federal government pulls the plug on the Government Open Systems Interconnection Profile (GOSIP) and gives the nod to TCP/IP.

Sept. 1994 Mosaic Communications announces Web browser called Netscape and Web server called NetSite at NetWorld+Interop. Two months later it adopts Netscape as the company name.

July 1995 Amazon.com launched.



May 1995 Sun launches Java.



Feb. 1996 Congress issues the Telecommunications Act of 1996, knocking down barriers in local and long-distance services, cable TV and other markets.

Feb. 1996 AOL reaches five million subscribers.

Dec. 1995 Compaq, 3Com and Sun pitch 1G bit/sec Ethernet as backbone alternative.

March 1997 Novell uses BrainShare '97 to show off new CEO Eric Schmidt.



March 1997 3Com agrees to acquire modem maker U.S. Robotics in a \$6.6 billion stock swap. Three years later it dumps the modem business into a joint venture and retains only the Palm business.

April 1996 SBC Communications and Pacific Telesis Group announce merger plan.

Nov. 1998 AOL acquires Netscape for \$4.2 billion.

June 1998 AT&T buys cable TV giant TCI for \$48 billion.

Oct. 1997 Responding to a British Telecom effort to take over MCI, WorldCom swoops in with a surprise \$30 billion offer.

Nov. 1997 AOL reaches 10 million subscribers



May 1998 Napster created by North-eastern University student Shawn Fanning.

June 1998 Microsoft releases Windows 98.

Nov. 1999 U.S. Judge Thomas Penfield Jackson rules that Microsoft is a monopoly.

Aug. 1998 One year after merging with Nynex, Bell Atlantic marries GTE in \$53 billion merger.

Jan. 1999 Lucent acquires Ascend for \$20 billion in an effort to round out IP and ATM product offerings.

April 1999 Melissa virus runs rampant on Internet, afflicting millions.

April 1999 AT&T fleshes out bold cable bid with proposal to pay \$58 billion for MediaOne, the fourth-largest cable TV operator.

June 1999 Akamai launches industry's first Internet content delivery service.

Aug. 1999 MCI WorldCom frame relay network brownout plagues 3,400 of the company's 14,000 frame users.

March 2000 3Com spins off its Network Systems business, which includes enterprise LAN switches and remote access gear.

Feb. 2000 Microsoft ships Windows 2000, which includes directory, security and management improvements.

Feb. 2000 Cabletron is chopped into four chunks: Riverstone, Enterasys, Global Network Technology Services and Aprisma.

Jan. 1, 2000 Y2K arrives with a whimper.



1996

August 1994 AOL reaches one million subscribers.

July 1994 LAN hub kingpin SynOptics (\$713 million) merges with Wellfleet (\$323 million), the second largest router maker, to form Bay Networks.



July 1995 IBM acquires Lotus for \$3.5 billion.

Aug. 1995 Microsoft releases the oft-delayed successor to Windows 3.1, Windows 95, which includes Internet Explorer 1.0.

Sept. 1995 Cisco agrees to acquire Grand Junction Networks, the inventor and leading supplier of Fast Ethernet (100Base-T) and Ethernet desktop switching products.

Sept. 1995 AT&T carves itself up, forming AT&T, Lucent and NCR. Lucent officially becomes a separate entity on Oct. 1, 1996.

Sept. 1995 EBay launched.

April 1996 Cisco acquires StrataCom, a supplier of ATM and frame relay WAN switching equipment.

Aug. 1996 Microsoft releases Internet Explorer 3.0 a week before Netscape releases Navigator 3.0. The browser wars start in earnest.

Nov. 1996 Microsoft gives developers preview copies of Windows NT Server 5.0 featuring distributed directory, security and management services.

Feb. 1997 Alteon, Foundry and other Gigabit Ethernet players show first wares at NetWorld+Interop.



June 1997 Dancing baby prances across the Internet.

Feb. 1998 Compaq ends Digital Equipment era, paying \$9.6 billion for the once-dominant minicomputer maker.

June 1998 Nortel buys Bay Networks for \$9.1 billion, targets integration of data, voice and video.

May 1998 SBC complements the 1997 acquisition of Pacific Telesis with the \$56 billion planned acquisition of Ameritech.



May 1998 Ethernet turns 25.

April 1998 Catastrophic failure takes all 145 switches in AT&T's frame relay network down for the count.



Oct. 1999 WorldCom proposes audacious \$115 billion acquisition of Sprint, but the deal is shot down by the U.S. Department of Justice on June 27, 2000.



June 1999 Former CEO of Bay Networks David House resigns as president of Nortel a year to the day after Nortel's acquisition of Bay.

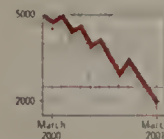
Feb. 2000 Web attackers take down Yahoo, eBay, Amazon, CNN.com and E*Trade with massive distributed denial-of-service attacks.

May 2000 Cisco acquires ArrowPoint Communications, a provider of switches used to optimize delivery of Web content, for \$5.7 billion.

Sept. 1999 IBM throws in the net towel, sells its switching and routing businesses to arch rival Cisco.

Oct. 2000 Five years after divesting Lucent and NCR, AT&T breaks itself up again, this time creating AT&T Business, AT&T Broadband, AT&T Consumer and AT&T Wireless.

2001 Tech-heavy Nasdaq tumbles to 2000 from a high of 5000 in March 2000.





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THE HOWARD 15

Industry luminary Howard Anderson picks the top network products and technologies of the past 15 years.

By Howard Anderson

Fifteen products that shook the networking world.

Where were you 15 years ago? Just starting out? An embryonic Young Turk? Asking daddy for the car keys? If you were in technology, you were witness to a string of unprecedented advances, each building on the one before. Some were pure technology; others were applications. Applications create stress; stress creates the need for products; products increase the ability to handle volume and lower costs — which brings on new applications. So before we look at my choices for the top 15 products of the past 15 years, let's look at the applications and technologies that set the stage.

● **The rise of e-mail.** In 1981, approximately 100 million e-mail messages were sent, compared with about 130 billion first-class letters. This year an estimated one trillion to two trillion e-mail messages will be sent. E-mail has been growing at 100% per year for 15 years and in 1999 surpassed first-class mail, which had been growing at less than 2% per year. But more importantly, e-mail has changed the world. It was the first computer application that everyone could, and did, use.

E-mail was the driver for all sorts of technology. With e-mail came the need for attachments, which pushed the need for storage. Back in 1986, some

were debating the importance of word processing, which turned out to be a trivial and silly application next to e-mail. E-mail stressed the corporate networks, and cost justified the billions that were invested.

● **The emergence of voice mail.** Before voice mail, the world was abuzz with pink "While you were out"

slips. Telephone tag was not the exception but the rule. Voice mail was the first new application of voice telephony in 75 years. It gave companies a reason to upgrade their PBXs and let managers use the telephone as a nonreal-time device. The PBX never fulfilled its promise as an intercompany data-switching device, but it did start the process of justifying telecommunications expense on a return-on-investment basis. Voice mail also morphed into an application for telephone companies, as users who had voice mail at work wanted the same functionality at home.

● **LANs.** Before 1984, the responsibility for inside wiring in any company lay with the telephone company. After 1984, companies took control of their destinies and began to run their own internal networks. Originally, LANs were justified because printers were expensive, and it was possible to share the cost by connecting several users together. Today, printers are cheaper than water, and LANs don't even have to be cost-justified anymore. Structured building wiring was a capital expense that made all the applications possible. It simplified management, and its success triggered even more applications, which overloaded the early LANs until entire departments were dedicated to delivering a

guaranteed service level. The need for an intelligent approach made users cognizant of the need to build along some common set of standards. So LANs and structured wiring were pushed by corporate users' need to handle larger files. This was the driver that made routing a reality.

- **Signaling System 7 (SS7).** Every communications advance is, in effect, a microcosm of the worldwide telecom network. Everything from the most rudimentary LAN to 3G wireless networks has a need to diagnose problems, restore the network and guarantee successful completion of an event. SS7 is used to send signaling information from exchange to exchange and to control central office switching equipment from remote locations. Without SS7, all those new Advanced Intelligent Network applications would never work. What makes SS7 important is that it is a signaling and control solution. Think of it as a platform that works. With the growth in traffic came the need for a network control system — and a byproduct of network control was interesting new applications such as automatic identification of dialing.

- **Packet switching.** Behind LANs, behind ATM, routers, switches and the Internet, stands packet switching. More money has been made from this technology than any other since the semiconductor. Packet switching is really more than 40 years old, but we keep recreating new applications. Today, we are talking about bringing broadband services to 101 million homes — all based on the idea that we can packetize transmission and switching at gigabits per second.

- **Protocols.** Imagine the Tower of Babel. People couldn't understand one another. Frustration reigned. Without protocols, we would be in a similar situation.

What we used to have was a one-vendor environment (IBM) in which we knew the products worked together, but were loath to introduce any competing products because they might not work as well together as that one-vendor environment. With protocols, multivendor environments could flourish, which brought out new competitors, lowered costs and fostered innovation.

The Top 15

These six applications and technologies were the catalyst for what I consider the top 15 products of the past 15 years. Each product has some common characteristics — each was the market leader, showed innovation and was brilliant in its timing and appeal.

15. Newbridge 3524 Channel Bank. Newbridge gave brains to the channel bank, a formerly dumb piece of telecom equipment in the central office that converted analog signals into digital to be carried over higher-speed lines to other exchanges. In doing so, Newbridge sparked the concept of the intelligent network.

14. Cisco 4500. Cisco didn't invent routing, but revisionist history will give it all the credit. This product let LANs be segmented and interconnected to WANs. Routing went from a cute little tactical

technology to a strategic one. Not every company needs routers, but every company needs routing. Cisco took that simple fact and built an empire.

13. Ciena MultiWave CoreDirector. This was the first commercial product to split light, launching the entire optical market. Before Ciena, wave division multiplexing was thought to be five years away and then only experimental. But Sprint saw the need early on and became the poster child for the rest of the industry.

12. 3Com network interface cards and bridges. 3Com commercialized bridges and at a price we all could afford, thereby creating plug-and-play networking. Ethernet was a joint venture of Digital, Intel and Xerox, but 3Com led the way.

11. Cascade 8000/9000 frame relay switches. Cascade was the first player to make a cost-effective wide-area data switch for carriers. This product brought carriers into the 21st century. Before this, they couldn't even spell d-a-t-a. Frame relay was a market that grew like kudzu; every year the market doubled, and the carriers found the first common ground with their most sophisticated users.

10. Redback SMS 1000. The first product to exploit the opportunity for subscriber management in DSL networks. This year, like last, the market for DSL will be constrained by supply rather than demand. The DSL networks that are succeeding are running on the Redback 1000.

9. Sonus Networks GSX9000 Open Services Switch. The first commercially viable carrier-class replacement for a Class 4 switch exploiting voice-over-IP technology. How the industry let Sonus sneak in and garner the market is going to be a Harvard Business School case for the next decade. Right product, right time.

8. Sun Java. The first open language that was extensible and independent of an operating system. And to think Sun almost overlooked it. Many of the innovative products in the industry started as quasi-skunk works projects until somebody realized that, like Java, they solved a real problem.

7. Ascend RAS 4000. Like working from home? Thank Ascend. This product invented work-at-home; it let remote users dial in to their companies and extend the corporate data network to their front porches.

6. Art Technology Group (ATG) Dynamo Applications Server. These guys invented personalization by building the first content Web server that allowed for dynamic information serving based on a user profile. All those "myWhatever" companies use this technology today. The future of the Internet is personalization, and ATG built it.

5. Microsoft Windows. Proved once and for all that stealing is the best strategy. What Apple proposed, Microsoft now owns. But what Windows did is give the rest of the developers a large target to aim at. Those who built to OS/2 standards are now pushing up daisies.

4. Palm Pilot. We are the Palm generation. This product made us forget the Apple Newton and begin building the blueprint for wireless information. It extended our contact and database files. Very infrequently does the industry get the right product in the right form at the right time. All the Handsprings and BlackBerries and other products that will follow owe a debt of gratitude to the team from U.S. Robotics. It created a revolution.

3. Nokia/Ericsson/Motorola cell phone. The service sucks, but you will never give up this product. What you lose in quality you make up for in flexibility. The cell phone revolutionized the world. Even mighty Motorola underestimated demand but the product made so much sense that it just plain took off.

2. Lyncity cable modem. You will give up your first born before you give back your cable modem. As addictive as cocaine.

1. Apple Macintosh. My Macintosh was my best friend. I loved it; it loved me. It had anticipatory intelligence; it knew what I wanted before I did. It understood me. There was this implicit contract between my Macintosh and me: We would look out for each other. The Macintosh was, without question, the single greatest product of the past 15 years.

If you build it, they will come

Robert Moses was a builder of roads and bridges in the time of Franklin D. Roosevelt. Moses truly had a black belt in spending and was unafraid to overbuild.

Yet he found that every time he built a superhighway or massive bridge, the traffic rose beyond even his optimistic projections.

The same is true with networks. Networks became necessary as we added applications such as voice mail, e-mail and streaming media. The applications clogged the networks, so we had to find solutions, such as packet switching and protocols, which worked to increase availability and reduce cost — which led to even more applications.

Every time we reached a roadblock, such as the need for network control, we found solutions that made our networks more failsafe, more vigorous. And we ain't seen nothin' yet.

This is the Network Century.

Anderson is senior managing director of Yankeetech Ventures, an early stage venture capital firm in Cambridge, Mass. He is also founder of The Yankee Group and the William Porter Distinguished Lecturer at the Massachusetts Institute of Technology. He can be reached at handerson@yankeetech.com.

A champagne glass is shown popping, with a large plume of white foam and liquid spraying out. The background is dark, and the scene is filled with falling confetti and long, flowing streamers in red, yellow, and green. The overall atmosphere is celebratory.

**A toast to you —
our customers and
partners —**

as we celebrate 15 years in the
networked world! Your vision, innovation and
loyalty has helped us share in the success of this
dynamic industry. Let's set our sights on a future of
continued growth and opportunity!

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15



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Compare some of 3Com's, Cabletron's and Cisco's oldest products with those the vendors offer today.

By Suzanne Gaspar

BY THE NUMBERS

To see just how far network gear has come over the years, consider what functionality your money would buy in 1986 and compare it to what you'd get today.

Star topologies and wiring hubs arrived on the scene in the late 1980s, making networks affordable, more reliable and easier to administer. Thanks to 1990's IEEE 10Base-T standard for Ethernet over unshielded-twisted pair wiring, the price of hubs and network interface cards (NIC) dropped dramatically. A switched port that used to cost more than \$2,500 costs less than \$50 today, giving IT professionals

more flexibility in designing their networks.

The explosion of Internet commerce and mobile access is driving demand for higher capacity and faster connections. Fortunately, widespread deployment of NICs, routers and switches brings higher speeds at lower costs, along with enhancements such as encryption, fault tolerance and load balancing.

Here's how the specifications and pricing of 15-year-old products from 3Com, Cabletron/Enterasys and Cisco stack up to the vendors' current wares. ▣

Cisco

Throughput:
10M bit/sec

Processor:
300 packet/sec

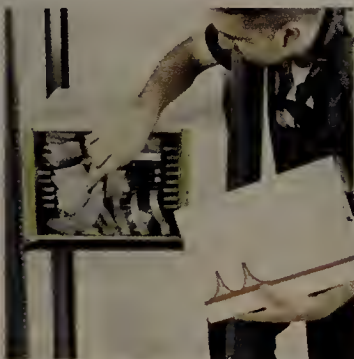
Features:
200 routing tables supported

Dimensions:
10 inches long by 17.5 inches wide by 20 inches high

Price: \$5,550

1986

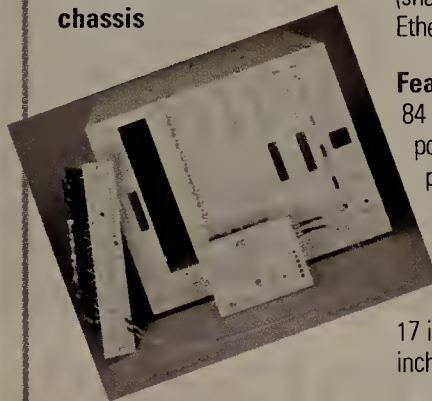
First AGS Router



Cabletron/Enterasys

1988

First MMAC-8 chassis



Throughput:
14,880 packet/sec (shared 10M bit/sec Ethernet)

Features:
84 single-segment coax ports, IRM repeater and proprietary management module, redundant power

Dimensions:
17.6 inches long by 17 inches wide by 14.5 inches high

Price: \$210 per port

2001

Layer 3 Expedition ER16 Switch

Throughput:
70 million packet/sec

Features:
Traffic prioritization, security, application load balancing

Dimensions:
19 inches long by 19 inches wide by 35 inches high

Price:
\$250 per switched Fast Ethernet port, \$1,250 per Gigabit Ethernet port



3Com

Speed:
10M bit/sec

Operating system:
DOS

Network operating system: Novell NetWare, LAN Manager, 3Share

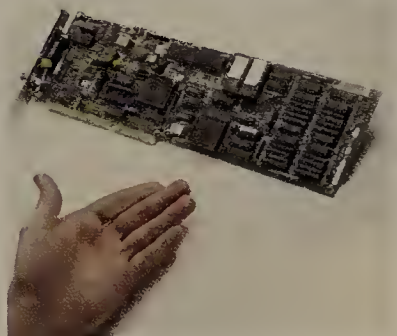
Features: None

Dimensions:
13.75 inches long by 4 inches high

Price: \$300

1986

EtherLink Network Interface Card



2001

Gigabit Server Network Interface Card



Speed:
1G bit/sec

Operating system:
Windows 2000, NT, Linux

Network operating system: Novell NetWare, NT, Linux, Unix

Features:
Bidirectional load balancing, resilient server links

Dimensions:
6.6 inches long by 3 inches high

Price: \$400

2001

Layer 3 Switch/Router 12016

Throughput:
80G bit/sec to 320G bit/sec

Processor:
Four million packet/sec per line card

Features:
15 line card slots, full redundancy

Dimensions:
22 inches long by 17.25 inches wide by 71.5 inches high

Price:
\$65,000



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Where experience meets opportunity!



Paul Severino not only lived through the major network epochs, his companies helped shape and drive them. And as a private investor he's still at it.

15 YEARS, A LIFETIME

When we went searching for an industry icon that could reflect on 15 years of networking, the name Paul Severino kept popping up. The 54-year-old Severino has seen and done it all. He started his career working on distributed minicomputers, jumped into Ethernet early and rode that wave, saw the routing tsunami coming and founded WellfleetCommunications — what would become one of the biggest routing vendors of the day — and ultimately merged Wellfleet with Synoptics to create the Bay Networks behemoth. Now he's heavily invested in optical companies. Mr. Severino stopped by *Network World* to talk with Editor in Chief John Dix about where we've been and where we're going.

NW: You founded Interlan in 1981 to build 10M bit/sec Ethernet cards. Now Ethernet is pushing 10G bit/sec. Did it ever occur to you Ethernet would make it this far?

SEVERINO: I grew up in the minicomputer industry where we were always trying to get more out of the computer. So I had this ingrained view about pushing performance. I always felt Ethernet would support more than 10 megabits. Of course at 10 gigabits it really doesn't have much to do with Ethernet any more. There's no more CSMA/CD, it's just switched. It's just sending packets down the line in an Ethernet frame format.

NW: You sold Interlan to Micom Systems in 1985 and then in 1986 started Wellfleet, the same year we launched *Network World*. What problem were you out to solve?

SEVERINO: Nobody was connecting enterprise local networks to WANs in an effective way. So I recruited some former Interlan folks to do that. From Day One we supported bridging and routing in the same product. That was one of the issues we thought was important because there was certain traffic you couldn't route, like DEC terminal traffic.



PHOTOS: TRACY POWELL

The reason that was important was because DEC was so pervasive. Most commercial environments had two computing environments. There were Unix workstations, usually Sun, and there were DEC VAXes. PCs were just starting to be installed.

NW: What about the whole IBM world?

SEVERINO: That was totally foreign to us in the LAN business. IBM was still building SNA networks. But that started to change in about '92. Union Carbide was one of our big customers and they said to us, here's our SNA network, it's 99.99% reliable, and the traffic on it isn't growing at all. Here's our multiprotocol network — Unix and VAXes and NetWare — it's 96% reliable but the traffic on it is growing like this [holds arm up in the air].

They said, "We want to do two things. We want to make this multiprotocol network more reliable, and we want to take our IBM traffic and put it on that network." So we became their corporate standard for wide-area

networking, which I thought was a huge breakthrough. And it turns out it was.

NW: What was Cisco doing at the time?

SEVERINO: We started in '86; Cisco started in something like '84. But they started with a product they took out of Stanford, and they were selling mostly to universities, a marketplace they knew really well.

Wellfleet, on the other hand, was started by entrepreneurs backed by funding. We had to start from scratch, and we had a view of the world that said we needed to support bridging, routing and multiple protocols, and we needed a multiprocessor architecture to maintain performance levels as you added more LAN connections. So our development effort took us about two years. In that time frame, Cisco was continuing to generate revenue.

Then around 1988 Cisco got its first round of venture capital and the VC put in senior management, which really focused Cisco on the whole internetwork market, including the

locked, but then we went public and got on *Fortune's* radar screen and, because we were smaller than Cisco, we actually grew faster than they did. That pissed off Cisco to no end.

So when Cisco had a big user group meeting in Boston, we rented the sign outside of Logan Airport and we said, "Wellfleet Communications, America's fastest-growing company, welcomes Cisco users to Boston," or something like that. [Laughs.]

NW: I would guess that kind of competition tends to focus your energies.

SEVERINO: It forced both companies to really work hard and to continue to innovate. But I've got to tell you, it was an intense time. Every day you went in to work and you had to work hard; you had to make sure your customers were happy. Cisco was so pervasive that even if they lost a deal, they would show up every quarter and ask the customer how things were going. So we became very customer-focused. And to this day, I believe it's the only way to run a company. You have to go the extra mile.

NW: In what sense?

SEVERINO: Well, I had BASF as a customer in Germany, and in those days we sold through a distributor over there. I met the user at a meeting in Europe and he told me

his network was always going down. So I sent some people out to take a look and they reported the company had old rev hardware, old rev software and they were running different revs here and there.

When I asked the distributor what was going on he said, "I put a proposal in for them to upgrade but they didn't want to do it." Well, it turns out his proposal was raping the customer — he was trying to collect more than a million dollars for this upgrade.

So I told him he was on thin ice and I was going to fix this problem, which got him all bent out of shape. We sent in a team between Christmas and New Year's and upgraded all the equipment. I showed up 30 days later and literally, when I walked in the room, everybody got up and applauded. [Laughs.] I charged them \$35,000 for a \$250,000 upgrade. It was more important to make that customer happy than to have them throw us out and go to Cisco.

NW: Fast-forwarding a bit to when you merged Wellfleet with Synoptics in 1994, why did you see that as a necessity?

SEVERINO: Well, we had a strong position in enterprise accounts, and we were working hard to get into the Internet side of the business. But two things were going on in the marketplace. One was Ethernet switching and two was ATM.

We were only a third or a fourth the size of Cisco and our resources were always focused on our core business, which was routing. The only way we could move into other business areas was to go on an acquisition spree or team

"When Cisco had a big user group

meeting in Boston, we rented the sign outside of Logan Airport and we said, 'Wellfleet Communications, America's fastest growing company, welcomes Cisco users to Boston.' "

commercial side. That's when we started to go head-to-head against them.

So when we were zero revenues they were probably almost \$20 million. But over time we actually closed that gap. By the time we merged with Synoptics they were three times our size, instead of 10 or 20 times our size.

NW: What would you attribute Cisco's ultimate success to?

SEVERINO: I think there are two things. One, they made the transition to Ethernet switching early, and they did it aggressively. And while we focused on the enterprise they built this strong position in the Internet. Most of the early ISPs, they were all buying Cisco. When that took off it was a given Cisco was going to get that business. But we both had strong direct sales organizations, and it was very tough competition.

NW: Any good tales?

SEVERINO: There are tons. Cisco had some aggressive salespeople. They would go in and say things that were true but not relevant. For example, when we were still building our product and raising money, they would go into an account and say, "You know, if Wellfleet doesn't raise money they'll go bankrupt." Well, that's true, but it's not relevant because we were going to raise the money.

So it was that kind of stuff. And we did some interesting things. In 1991 or '92 Wellfleet was named the fastest-growing company in the U.S. by *Fortune* magazine. Cisco had that position

VITAL STATS

Age: 54

Family: Wife, three daughters.

History: Born in Paterson, N.J., to a working class family.

Education: Degree in electrical engineering from Rensselaer Polytechnic Institute 1969.

Work history:

1969: Design engineer, Digital.

1972: Design engineer, Prime Computer.

1976: Founded Data Translation, a company working on data acquisition products.

1981: Founded Interlan, a maker of Ethernet network interface cards.

1986: Founded Wellfleet to build routers for interconnecting enterprise LANs.

1994: Merged Wellfleet with Synoptics to form Bay Networks.

1996: Left Bay Networks.

1997: Interim CEO of Netcentrix, a company that made Internet fax gear that has since closed.

Current activities: Serves as a board member for Photonex, Media 100, SilverStream, Sonus, Tenor and MCK Communications, all of which he has invested in as a private venture capitalist.

Extra curricular:

- Chairman of the board of Massachusetts Technology Development, a venture capital fund run as a state agency. Board members are appointed and receive no salary.

- Active chairman of the Scholarship Committee for the Massachusetts Telecom Council, which gives scholarships to students going to technical schools.

Hobbies: Avid golfer.



with a partner.

Synoptics was in the same boat. They had to move beyond hubs and were developing switching and ATM technology. But they needed routing. We had to get into switching and ATM more quickly, so we felt putting all of this together could leapfrog us in the marketplace.

That was all true. Where the problems came up were the ATM and the switching technologies Synoptics had were not fully developed, so it took longer to get them to market. As a result we lost an opportunity.

"If I went to my board

and said I want to buy this company for \$150 million and I've got 10 days to do it in and the only diligence

I can do is this kind of diligence, they would look at me like I was crazy."

A lot of people thought there was a cultural problem in that merger. It was less culture and more product. We couldn't get product out fast enough.

NW: Cisco, on the other hand, went on an acquisition spree.

SEVERINO: They did some very successful deals. Crescendo is a good example. They bought it for \$120 million and it's probably the best money they've ever spent. Whereas they bought Stratacom for \$4 billion and it's probably the worst \$4 billion they ever spent.

Going the acquisition route would have been hard for me because culturally the East Coast at that time was different than the West Coast. If I went to my board and said I want to buy this company for \$150 million and I've got 10 days to do it in and the only diligence I can do is this kind of diligence, they would look at me like I was crazy.

NW: Old world?

SEVERINO: The Harvard Business School mentality. In California it was, "We've got to go buy a bunch of companies, and guess what, some of them are not going to make it but we're going to take those risks." We've changed a lot [on the East Coast]. But in those days, it was a different culture.

So the SynOptics/Wellfleet merger was strategically well conceived, although the execution was not as

good as it should have been. Having said that, we more than doubled our business; went from a billion-dollar company to \$2 billion in two years.

But it wasn't fast enough because Cisco was really ramping up their Ethernet switching environment and the Internet was exploding.

NW: Is there anything you would do differently?

SEVERINO: I grew up as an engineer; I worked for the first 10 years developing products. I've never been a salesperson and I was competing against CEOs who were salespeople. So their view of their job was differ-

ent than my view of my job.

Their view was you have to be out with the customers. If we had an account like Sprint, Cisco would make it a point to be in there at the CEO level on a regular basis telling them why they should be doing business with Cisco. I should have

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become more of a salesperson.

On the merger thing, I now understand that no matter how compatible these things may look on the outside, when you put them together the incompatibilities get magnified.

NW: And the sale of Bay to Nortel — give us some background on how

that came about.

SEVERINO: Well, Dave House — who had been at Intel 20-odd years — came in and took over Bay. Although Dave wasn't a networking guy, he came in said, "Here are the things we have to do," and the board was very much in sync. Dave executed well and began to show signifi-

cant gains in a lot of areas. Our stock went from the 20s to the 60s and 70s again. So it was good.

But he realized over time it was going to be tough for him to make the kind of headway against the Cisco machine that he thought he could, so he said if we have an opportunity to team with a bigger company, we ought to think about doing it. Nortel was interested in our routing technology and so that deal came together relatively quickly.

It was a good thing for Nortel and Bay Networks. But that's when I stopped having an association with Bay Networks.

NW: Given your struggles with Cisco, why do you think Juniper is having success against them?

SEVERINO: That's a good one. After I left Bay, I never would have thought that would be a good business to go start — high-end routers focused on the very high end of the network. Cisco had such a strong presence with those customers.

But a bunch of things happened to make Juniper a success. Good financing, lots of partners that would bring Juniper's name into major accounts and Cisco not providing product on time. All of those things had to go right. That takes nothing away from the fact that the guys at Juniper built a great product. The vice president of engineering there is from Wellfleet.

NW: Shifting a bit to look at what you're involved with now. You're investing in a lot of optical companies. Where do you see this high bandwidth stuff going?

SEVERINO: When the telephone business started, it was basically about being able to call someone on the telephone. Right? Well, today it's not much different. The Web is about the ability to do more. The question is, how much more? In your business, wouldn't it be great to be able to walk into this room and do a video-conference with *Network World* people around the world? Instead of having to deal with ISDN lines and telephone numbers and all that stuff?

That's what we need. That's what it's going to come to. Both on the business and consumer side.

NW: How many years away do you

think we are from that kind of thing?

SEVERINO: Five or 10.

NW: You're now a private venture capitalist. How has the VC community changed the business of developing and running technology companies?

SEVERINO: When I came out of college and went to Digital, Digital was a venture capital-based business. And when I went to Prime Computer, the board of Prime Computer was made up of mostly

venture capitalists. Over time I realized that what made these start-ups happen was venture capitalists and entrepreneurs working together.

Where a lot of entrepreneurs view venture capital as a necessary evil, I never felt that way at all. I could never have done what I did without venture capital, period.

The amount of venture capital out

there is a big win for the country. Like everything else, there are excesses. There's probably too much money in venture capital right now for it to be effective. So the returns will probably come down, just because there's not going to be that many good deals available.

NW: Besides being a private venture capitalist and sitting on many company boards, what do you do with your time?

SEVERINO: I'm in an interesting situation now. I worked for probably 30 years full-time, almost taking no time off. I would only take one week a year. But now we have a house on Martha's Vineyard and I like to disappear down there for the summer. It turns out there was a lot of high-tech people down there who are doing what I'm doing.

NW: So you can't even escape down there?

SEVERINO: No, no. They're friends. They're not in companies anymore. They're doing what I'm doing. So it's a great environment. I'm not anxious to go try to run another company. Once you've built a company like Wellfleet, it's hard to think that you can do another one of those. [Laughs.] You're better off making an impact in a different way. ▀

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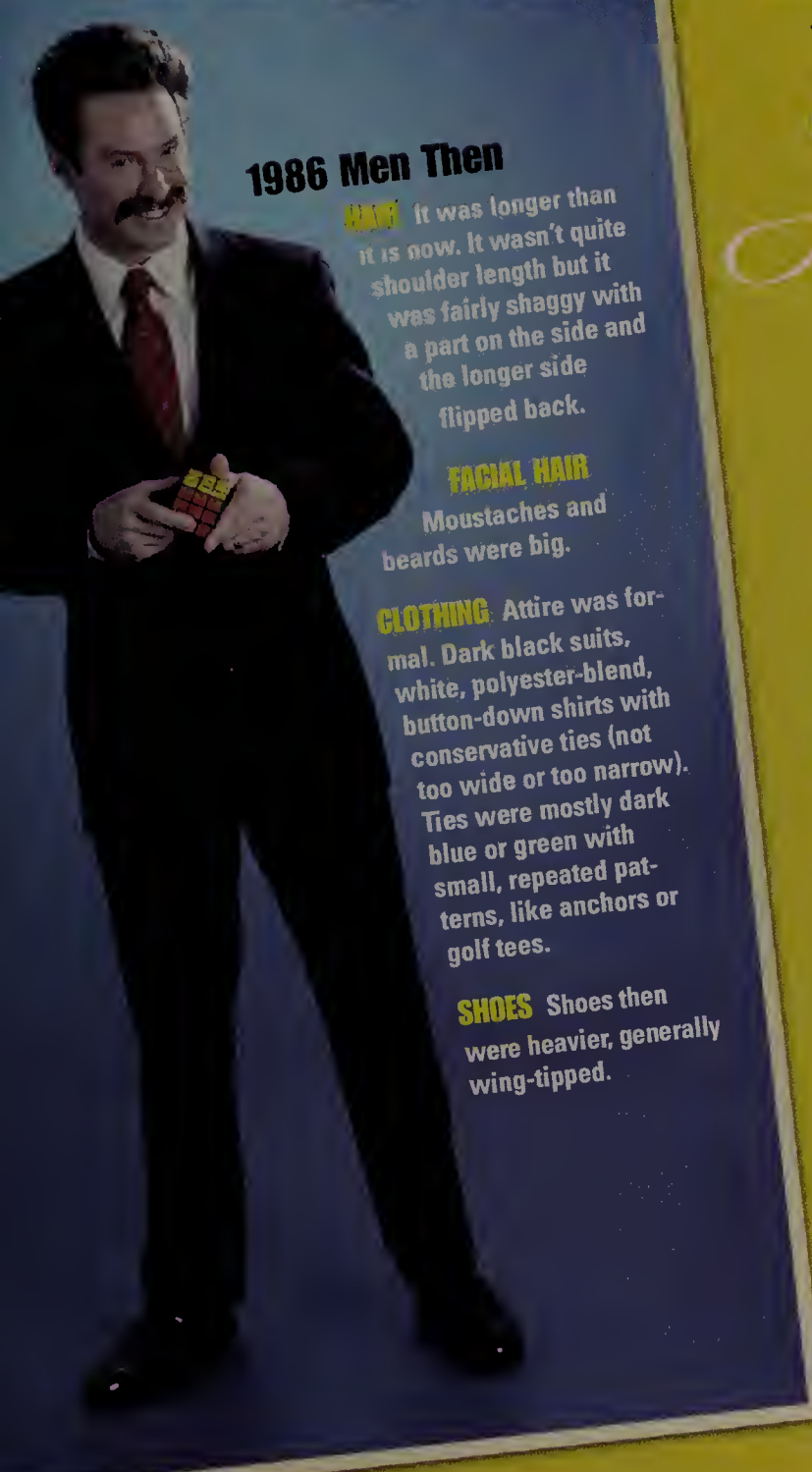
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FASHION: NOW AND THEN



1986 Men Then

HAIR It was longer than it is now. It wasn't quite shoulder length but it was fairly shaggy with a part on the side and the longer side flipped back.

FACIAL HAIR Moustaches and beards were big.

CLOTHING Attire was formal. Dark black suits, white, polyester-blend, button-down shirts with conservative ties (not too wide or too narrow). Ties were mostly dark blue or green with small, repeated patterns, like anchors or golf tees.

SHOES Shoes then were heavier, generally wing-tipped.

2001 Men Now

HAIR Short, cropped hair — not a buzz cut but fairly short.

FACIAL HAIR Nothing or a goatee.

CLOTHING Today's clothing is business casual. Cotton button-down shirts — white or medium blue. If a tie is worn, it's a conservative size with subtle patterns. Dress pants, though not suit pants, in greys, black or brown, and possibly a sweater, like a cardigan or sweater vest, over the shirt.

SOCKS Plain dark socks — don't get crazy.

SHOES Brown or black lace-up shoes... no slip-ons, please.



1986: Dress for Excess 2001: Business Casual

Janet Jackson's song "Nasty" was big. On the big screen "Platoon" was big, but for sheer heart acceleration, it didn't get much bigger that year than "Top Gun." It was 1986.

And did I mention big? Well, then let's talk hair. Guys had lots of it but women's hair was... well, it could

have had its own IP address.

Just 15 years later, big and stuffy has been replaced with casual. For women, skirt suits have been replaced by pants and sweaters. And men have tossed aside their full suits for dress pants and a button-down cotton shirt.

— Sharon Gaudin

2001 Women Now

HAIR Women's hair today is very natural. If it's naturally straight hair, women wear it straight. If it's naturally curly, let it be curly. And in the workplace, it is down as often as it is worn up.

GLASSES Small, wire-rim models.

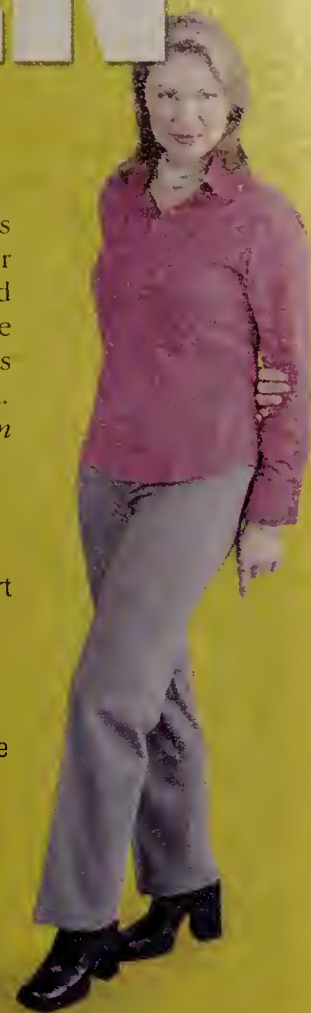
JEWELRY Small and understated — no odd piercings in the workplace.

CLOTHING Tailored pants — black, grey or

brown. And a men's-style button-downed shirt or a light-weight sweater set. Pink and light green are "in" colors.

LEGGINGS If they're wearing pants, women are wearing matching trouser socks. If they're wearing a skirt, they may wear dark leggings instead of nylons.

SHOES The shoes are stylish, dark and chunky. The slim-heeled pump is long gone because it's far too formal.



1986 Women Then

HAIR What can I say? It was big! And it was always trying to be something it wasn't, such as straight hair that had been permed. It was often teased and feathered back.

GLASSES Again, big! The frames were plastic and often had a light color to them. The bows often got funky too.

JEWELRY Have I mentioned big? Big silver earrings, bracelets.

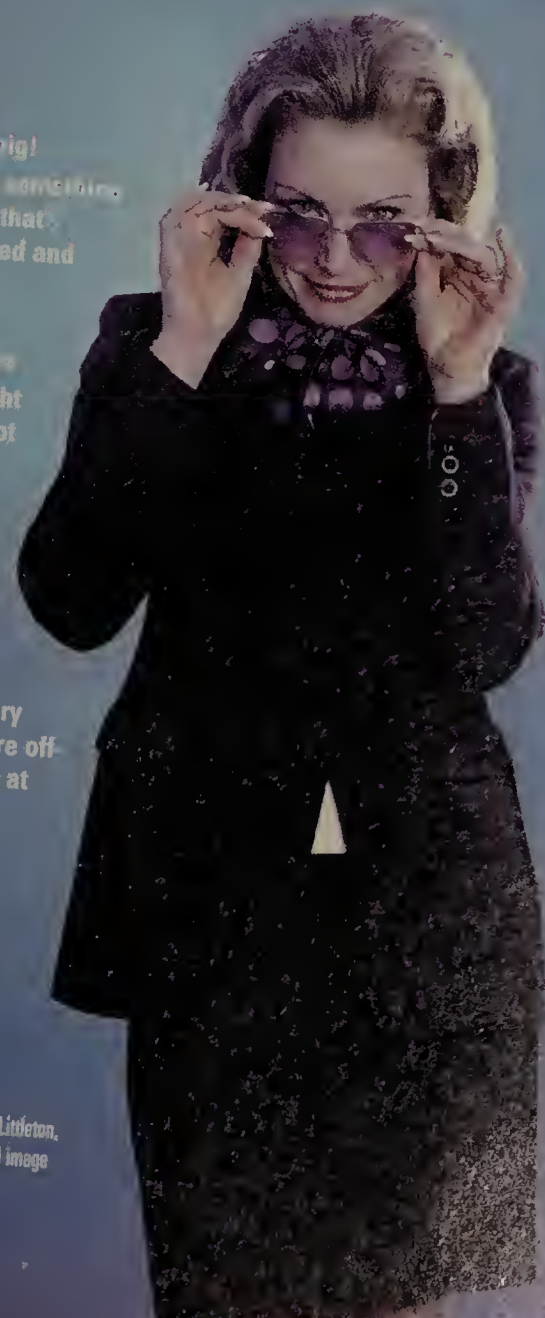
CLOTHES Silk or wool suits. Skirts. No pants. Absolutely no pants. The suits were dark and very professional looking. Blouses were off-white and blousey with a big bow at the throat. Feminine was in.

NYLONS Nude

SHOES One and a half to two-inch heels. Blue or black pumps.

Fashion tips from Jean Gaffney, president, Gaffney & Co., a Littleton, Mass., management consulting firm, specializing in personal image and executive coaching.

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LOCATING LEGENDS

By Deni Connor

Locating the key network industry influencers of the past 15 years turned out to be harder than we thought it would be. Some, such as Robert Morris, who gained notoriety for unleashing the first Internet worm, are keeping low profiles. Others, such as Ascend founder Robert Ryan and Cabletron co-founder Bob Levine, were unavailable for interviews because they were off enjoying the fruits of

their labor. And still others, such as Cisco co-founder turned cosmetics entrepreneur Sandy Lerner, are just tired of talking about networks.

But we did catch up with a handful of the movers and shakers and got a chance to ask them what they're up to now and to share some reflections on how the network industry has evolved.

LAURIE BRIDE

Talk to Laurie Bride, senior enterprise architect for Boeing, and you'll find that she has a passion for networking that hasn't abated over the past 15 years.

Today, Bride takes a high-level look at networks, working to design network applications. In 1985, however, Bride had her hands buried deep in the network protocol stack, forming methods for different computers to talk to each other. She authored the Technical Office Protocol (TOP), a companion to the Manufacturing Automation Protocol (MAP), worked on the Open Systems Interconnection model and TCP/IP, and was active in early interoperability demonstrations.

"We accomplished our goals, whether it was MAP/TOP or what has developed into the Internet," she says. "Our objective was to get users knowledgeable about the problem and to communicate to the vendors that we wanted a solution."

In 1988, Bride participated in the Enterprise Networking Event (ENE), a demonstration she rates as the most important network event of the past 15 years.

"The ENE established that there were solutions to the information-sharing and communications problems among different vendors," Bride says. For the first time, 131 different computing systems were linked and simulated an enterprise network.

Bride's work paid off for Boeing.

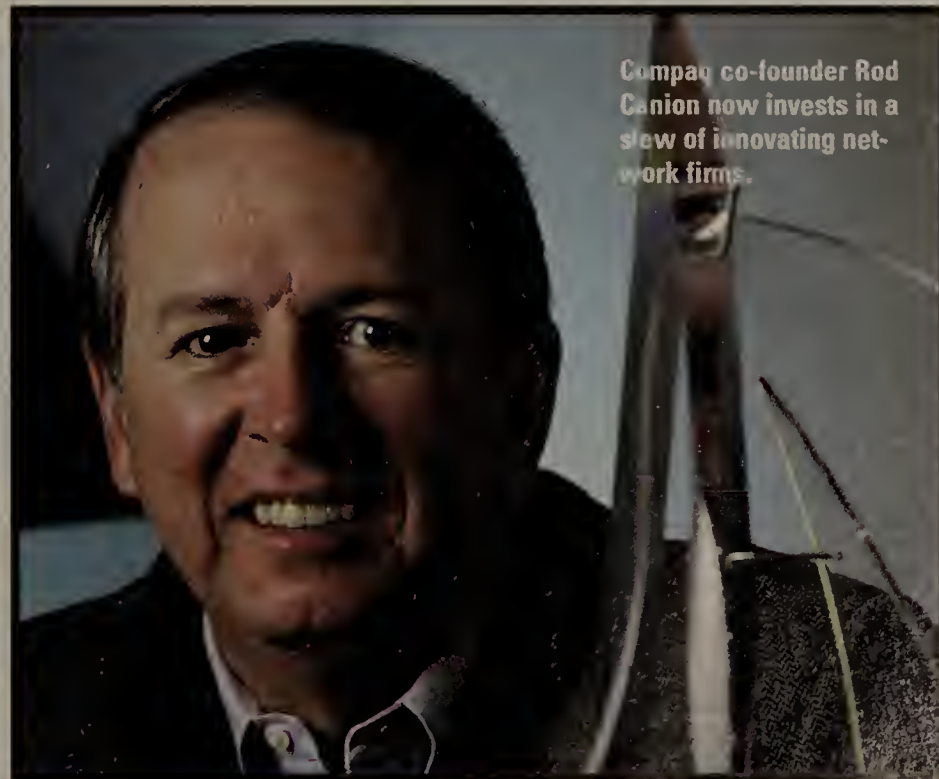
Laurie Bride

1985	As a Boeing manager, develops Technical Office Protocol (TOP).
1986	Combines the Manufacturing Automation Protocol (MAP) and TOP User Groups; serves as representative to Corporation for Open Systems (COS).
1987	Coordinates the alignment between the Government Open Systems Interconnection Protocol (GOSIP) and TOP; joins OSINET steering committee to develop a national OSI interoperability test network.
1988	Sponsors Boeing booth at the Enterprise Networking Event, which grew out of OSINET work.
1990	Continues activities with MAP/TOP, GOSIP and COS.
2001	Senior enterprise architect for Boeing Commercial Airline Group.

ROD CANION

Today, Rod Canion, co-founder of Compaq, is investing in companies that have good teams and come up with different ideas.

An advocate of wireless technology, 56-year-old Canion is investing in companies that speed content to users, such as MessageASAP and Surgient. He's also put his money down on a diverse set of companies such as Questia Media and Tricord Systems. Questia is an online research service that will give students access to over 50,000 books. At Tricord,



Compaq co-founder Rod Canion now invests in a slew of innovating network firms.

F. CARTER SMITH/MPG

Canion served as co-CEO until shortly before the company introduced its first server and storage appliances.

In 1981, after Sevin Rosen Funds rejected funding a plug-in disk drive for the IBM PC, Canion and cohorts Bill Mutro and Jim Harris met with a designer at the House of Pies. It was

there that the designer sketched a portable PC on a dinner napkin. That sketch would be the origin of Compaq, a company Sevin Rosen and other investors funded with \$1.5 million — back then a big investment.

Ask him how he would have handled the mergers of Tandem and

Digital with Compaq, and he suggests a different scenario. "If Compaq had actually merged with Gateway, as was rumored in the press, you'd have seen a much stronger industry leader," he says. "The combination of Gateway's direct capability and Compaq's business brand would

have allowed Compaq to more successfully compete with Dell and stunted a lot of its growth."

Rod Canion

1986	CEO of Compaq, a company he co-founded in 1982.
1991	Leaves Compaq.
1992	Starts up Insource Technology Group, an IT consulting and development firm.
1993	Named co-CEO of Tricord Systems, a server and storage appliance company.
2001	Chairman of Questia Media, an online subscription-based research service.

DAVID HOUSE

Former Bay Networks CEO David House, who lives on the edge by helicopter skiing and racing fast cars, is now focusing on the edge of carrier networks as the leader of newcomer Allegro Networks.

House says the San Jose start-up is readying products aimed at helping carriers break through the latest "network choke-point" so they can deliver broadband services over wider geographic areas. The company is trying to exploit the shift from circuit to packet switching in carrier

David House

1986	Head of Intel's Microprocessor Division.
1991	Coins term "Intel Inside" for the company's 486 processor.
1996	Becomes CEO of Bay Networks.
1998	Following Nortel's acquisition of Bay, House becomes Nortel's president.
1999	Leaves Nortel and relaxes, works on charitable activities.
2001	CEO of Allegro Networks, a carrier network infrastructure company.



STEVE SKOLL

Allegro's David House is focused on breaking through the latest "network choke-point."

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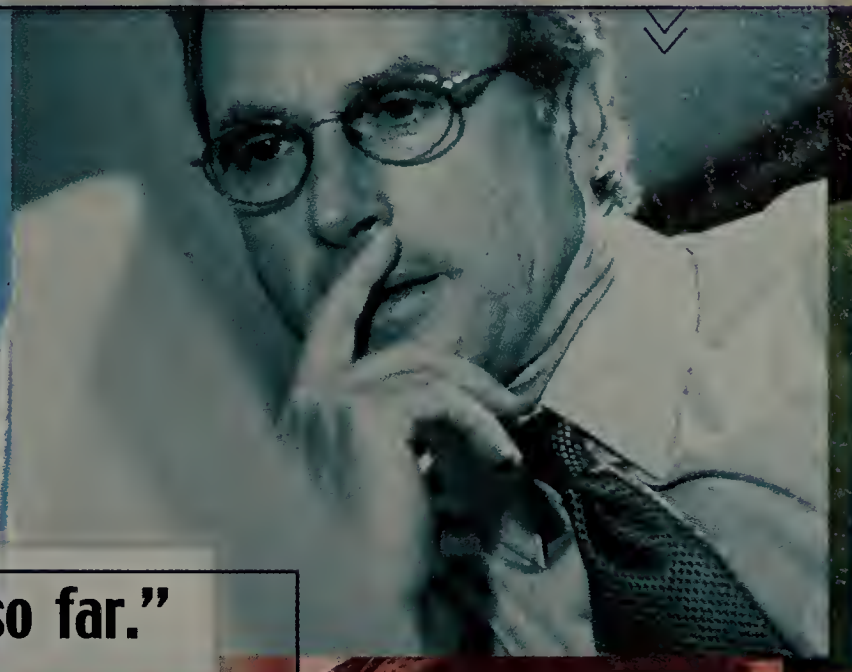


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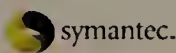
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networks, which House says is the most important network change over the past 15 years.

"The tremendous advances the industry has made in optical technology, in the number of bits we can put down an optical fiber, is doubling every eight months, far beyond

what Moore's Law provided in semiconductors," House says. "The long-distance business is rapidly becoming a zero-margin business. That has created an unbelievable capacity in trunking and put all the pressure on the edge of the network."

Before joining Bay, House enjoyed

a 14-year career at Intel, where he transformed the advertising slogan Intel used in Japan, "Intel In It," to "Intel Inside" and spurred Intel's most successful marketing campaign. He also oversaw Intel's server group.

"I moved from Intel to Bay Networks when I saw that the limiting

factor in the use of the computer network was not the speed of the processor but the performance of the network," says House, who spends time out of the office working with the Computer History Museum in Mountain View and with disadvantaged kids at the Palo Alto Boys and Girls Center. "The choke-point was there."

BUD HUBER

Former Hughes Aircraft network planner Bud Huber has been collecting evidence of one kind or another for years.

Today, you might find him photographing evidence for insurance companies, lawyers and police organizations — an activity he under-

Bud Huber

1985	Manager, strategic planning at Hughes Aircraft.
1989	Founding chairman of the User Alliance for Open Systems.
1991	Founding chairman of the Enterprise Networking Roundtable.
1993	Member of ATM Forum board; Enterprise Networking Roundtable becomes the forum's user group.
1995	Sent to Hong Kong by Hughes for three years to help build an airport.
1999	Retires from Hughes and joins Computer Sciences Corp.

takes as a sideline to his job at IT consulting firm Computer Sciences Corp. (CSC).

In the past, Hughes made it his business to collect evidence on behalf of enterprise net managers that could be used to get network product and service vendors more in line with customer needs.

Huber was among the most visible enterprise network advocates of the 1980s and 1990s, serving as the founding chairman of both the Enterprise Networking Roundtable and the User Alliance for Open Systems, a group that later became the voice of customers within the ATM Forum.

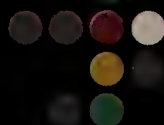
Huber says that although ATM never reached its potential in enterprise networks because of its complexity, he doesn't consider the technology a failure.

"Technologies such as ATM, wireless or ISDN haven't been failures," he says. "It's been a failure of the internetworking [product and service companies] to achieve elegant simplicity in implementing them."

He points to the Ethernet connector and the URL as the most significant networking technologies of the past 15 years because they were

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Huber retired from Hughes in 1999, thought he might settle down in Fort Worth, Texas, but then joined IT consulting firm CSC. He describes himself as CSC's "chief parachutist" — as a member of the company's executive staff he travels to cus-

tomers locations, and jumps in to evaluate and solve their IT problems.

RAY NOORDA

Ray Noorda rescued Novell back in 1982, when he joined the then-struggling network hardware and

software company and helped turn it into the dominant player in the network operating system market.

In leading Novell until he retired in 1994, Noorda fought the good fight vs. Microsoft, which stumbled more than once in the NOS business before eventually leapfrogging

Novell in market share a few years back. Noorda fought Microsoft on several other fronts, too, including the desktop software market, where Novell attempted to compete with Microsoft through its acquisitions of WordPerfect, Borland's QuattroPro spreadsheet and Digital Research's DR-DOS.

Not all Noorda's moves worked, for sure. But that hasn't stopped the man who is still Novell's largest individual shareholder from battling Microsoft to this day.

The press-shy Noorda, who declined to be interviewed for this article, now oversees The Canopy Group, which was originally formed to invest in things that Noorda thought Novell should be doing.

Canopy Group dropped its Novell focus in 1996 and now concentrates on open source and network infrastructure offerings. Canopy, a venture fund valued at between \$1 billion and \$2 billion, invests in companies such as Caldera, Intl., Lineo and Linux Networkx, all of which offer Linux products designed to give companies a choice beyond Windows.

"Anything that would be viewed as a monopoly or controlling the industry, Ray does a pretty good job of creating something to cause some pain for that entity," says Ralph Yarro, CEO of Canopy Group, which is part of the larger Noorda Family Trust. That trust also includes cash holdings in a string of car dealerships valued at \$50 million, investments in a couple of network storage companies and funding for several charitable groups.

According to those who work with the peripatetic 76-year-old Noorda, he still operates in much the same fashion he did while at Novell. He does a lot of management by walking around and has even arranged the offices of the companies funded by the Linden, Utah, Canopy Group in such a fashion that he can walk among them. He also is said to graciously let anyone make a mistake — as long as they get it right the second time. ▀

Ray Noorda

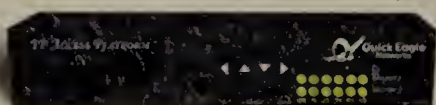
1986	CEO of Novell, a company he joined in 1982 and took public in 1985.
1991	Leads Novell as it grabs more than 60% of the network operating system market, a share that will plunge to about 50% by 1995.
1994	Retires from Novell.
1995	Founds The Canopy Group, a venture capital company.
2001	Chairman of The Canopy Group and Noorda Family Trust.

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IP Access for managed services

EATING CROW

LET'S NOT FORGET THE FLOPS

By Michael Cooney

"When I make a mistake, it's a beaut!"

Fiorello La Guardia

Mistakes are never small in the network world. They may be quickly forgotten or swept under the rug, but they are never small.

Here we take a look at a number of developments chronicled — OK, hyped — in *Network World* during the past 15 years that have flopped like so many dead fish. It's not pretty.

Dot-coms

Few times in the history of flops has a movement come and, well, been kicked into submission so quickly. A study released in January said that 210 don't-com firms were shuttered in 2000 — 121 between October and December alone.

The study went on to say of the dot-com deaths, about 75% offered products or services primarily for a consumer audience. Another 21% had a busi-

ness clientele, and the remainder had a blend. E-commerce companies accounted for just more than half the closures. Content-based properties made up 30%, while infrastructure and online service companies made up the remainder.

The study's author, Webmergers.com, reports that between 12,000 and 15,000 dot-comers lost their jobs. Of course, there are thousands of dot-coms left — some successful — but their failure rate in the past year and a half is unprecedented. For now, that alone earns them a spot on this list.

Telecommunications Act of 1996

Many are still arguing over its impact, but we'd have to say this act has been a failure. Does anyone remember what this legislation was supposed to accomplish? Let us remind you. The act was supposed to:

- Open local service to competition.
- Let regional Bell operating companies provide long-distance service.
- Deregulate certain cable rates.
- Let local telephone companies sell video services.
- Protect Universal Service.
- Change broadcast ownership rules.

Of those six major points, only Universal Service has succeeded. Local competition is a joke. RBOC long-distance — with the exception of Verizon (in one state) and SBC Communications — is another laugh-riot. Since the act, competition in general has taken a huge hit with all the mergers and acquisitions (four of the original seven Baby Bells no longer exist). Even what many considered to be the big carrot of the act — the ability to sell long-distance — is no longer a draw because of lower rates (maybe the only good thing to come out of all this). One analyst sized it up this way: "The Telecom Act didn't open floodgates as envisioned."

APPN

What would a "flops" section be without a bloated and failed IBM plan? Pretty much everything IBM's networking group did (in one iteration or another) in the late '80s and throughout the '90s is already dead, is being phased out, or is owned by Cisco.

Perhaps no technology flamed as vividly as Advanced Peer-to-Peer Networking. Why, we remember like it was only yesterday talking about the quintessential strengths of APPN, its peer-to-peer networking capabilities, its sophisticated class-of-service features . . . all shot to hell.

IBM did just about everything wrong here. It made APPN gear complicated and costly (it even wanted royalties from potential third parties that could have helped establish the technology, remember that?). APPN's role did bring about one of the great industry squabbles. At one point in 1994, IBM's Rick McGee, promised to "kill" vendors (read: Cisco) and "eat our own young" before IBM would let any rival cannibalize its mainframe channel-attached SNA segment of the network. Ouch.

25M bit/sec ATM to the desktop

Classified mostly as a solution looking for a problem, 25M bit/sec ATM to the desktop failed before it really got rolling. While many folks thought the idea of providing all that bandwidth to user PCs was worthwhile, the idea of paying twice as much for the luxury compared with switched Ethernet didn't fly. It wasn't the last technology Ethernet would whack of course (see HSTR and FDDI).

High-Speed Token Ring

This technology took a called strike three in the bottom of the ninth with two outs and the bases loaded. Token ring in general by the late '90s was suffering from years of battles with Ethernet. High-Speed Token Ring (HSTR) was supposed to be the last hurrah, but it just never happened. One of our readers summed up HSTR this way: "End users failed to rally around HSTR, and the token-ring vendors are basically giving up." To say the least. By the end of 1998, HSTR's champion, IBM, pulled the plug. Madge and Olicom did the same soon after.

FDDI

Once the fashion plate of high-speed LAN users, 100M bit/sec fiber-optic gear has run out of gas. More to the point, faster and less-expensive technologies — such as Gigabit and Fast Ethernet — have supplanted it. Most of the last FDDI chips shipped in January 2000.

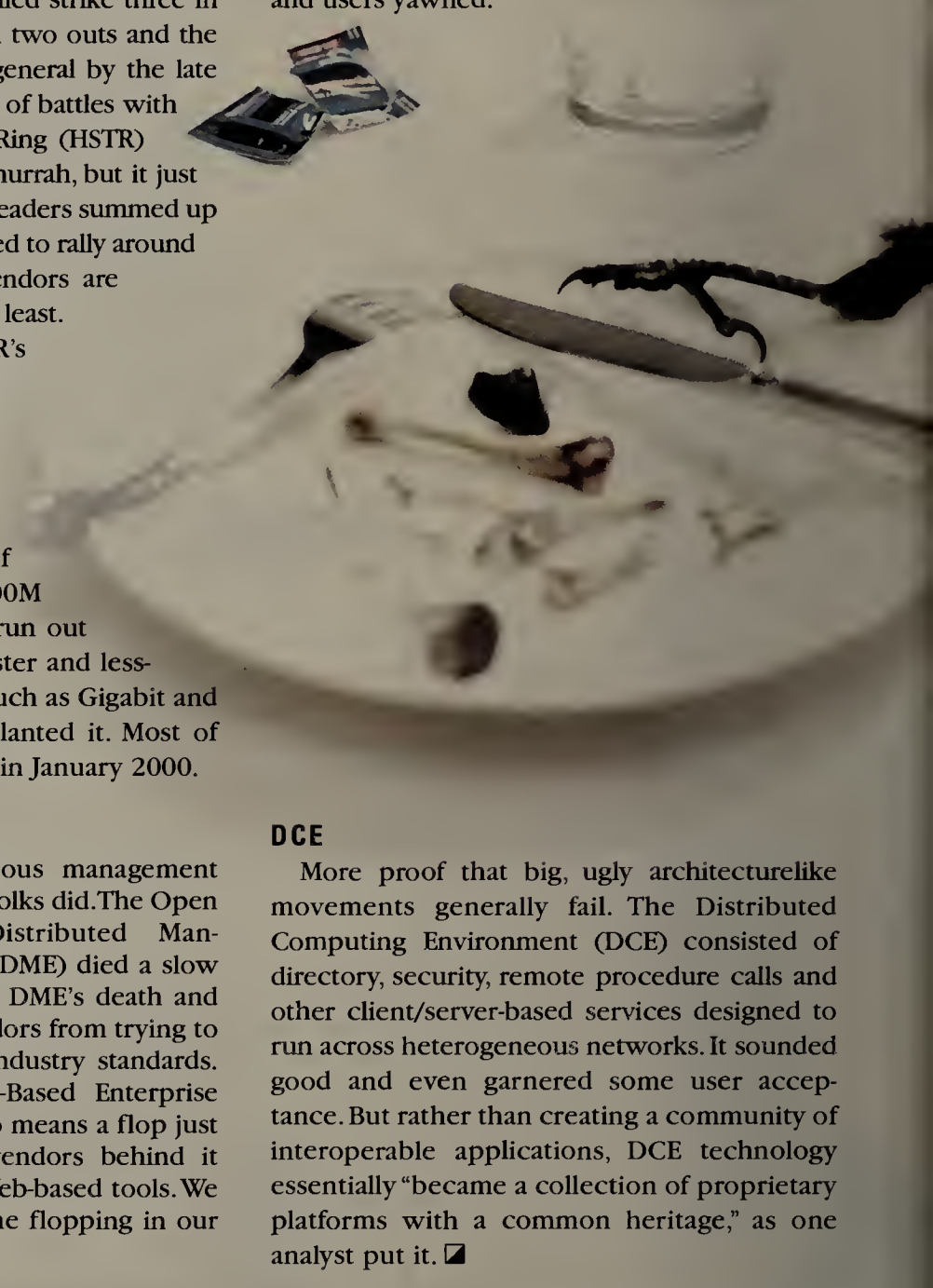
DME

Can you say "overambitious management standards initiative?" Lots of folks did. The Open Software Foundation's Distributed Management Environment (OSF/DME) died a slow death in the early '90s. Still, DME's death and legacy hasn't prevented vendors from trying to come up with other cross-industry standards. Oh, no. Can you say Web-Based Enterprise Management (WBEM)? By no means a flop just yet, WBEM has some 70 vendors behind it promising a new breed of Web-based tools. We may be writing about his one flopping in our 20th anniversary issue.

OSI

We'd be remiss not to highlight one of the all-time great failures of this industry: Open Systems Interconnection. You may recall that OSI was a set of standards for creating truly interoperable multivendor systems and networking.

It never happened. Oh, the OSI seven-layer model is a reference tool, but products really tanked and users yawned.



DCE

More proof that big, ugly architecturelike movements generally fail. The Distributed Computing Environment (DCE) consisted of directory, security, remote procedure calls and other client/server-based services designed to run across heterogeneous networks. It sounded good and even garnered some user acceptance. But rather than creating a community of interoperable applications, DCE technology essentially "became a collection of proprietary platforms with a common heritage," as one analyst put it. ■

They said it, all right...and some might regret it.

Human beings are not blessed with the ability to predict the future. If we were, we'd all make a killing off those office basketball pools.

Predictions can be a source of great amusement, though. Below is a collection of the funny and dead-on.

On evil incarnate: Microsoft

"I believe OS/2 is destined to be the most important operating system, and possibly program, of all time. As the suc-

cessor to DOS, which has over 10 million systems in use, it creates incredible opportunities for everyone involved with PCs." — **Bill Gates**, chairman, Microsoft, 1988

On ATM to the desktop

"The 25M bit/sec ATM market still has far too many evangelists and not enough practicing mechanics. But 1996 will be the year 25M bit/sec products out-ship other ATM technologies, like 155M bit/sec adapters."

— **Thomas Nolle**, president, CIMI Corp., spring 1995

"It seems like an answer to a question that nobody's asked. I haven't seen any driving need for slow ATM as opposed to fast or switched Ethernet." — **Bert Manfredi**, senior engineer, U.S. Navy, spring 1995

On Y2K:

"My pool holds 15,000 gallons of chlorinated water. I will have full gas tanks and enough cash, milk, bread, peanut butter and vegetables to last a month. After that, if things are bad I'm going to start walking out of the desert because if infrastructure fails, I'm not going to

stay in Phoenix."

— **Steve Blass**, network architect, Sprint Enterprise Network Services

On the 'Net culture

"Internet Explorer: It's nice, but no Netscape killer." — **Adam Gaffin**, Network World review, February 1996

"During my service in the United States Congress, I took the initiative in creating the Internet."

— **Al Gore**, former vice president, March 1999

ARE YOU A NET KNOW-IT-ALL?

Test your brain

OK smarty-pants, challenge yourself with this collection of questions about some of the most interesting happenings, technologies, companies and personalities of the past 15 years in the network industry. The answers appear upside down at left.

1 Which company did network security company VeriSign spin off from in 1995?

- (A) IBM
- (B) Nortel Networks
- (C) RSA
- (D) Trusted Information Systems

2 Which software firm was incorporated in 1995 by Bill Coleman, Ed Scott and Alfred Chuang?

- (A) BEA Systems
- (B) Caldera
- (C) Pointcast
- (D) Red Hat

3 WorldCom beat out British Telecom in a bidding war for MCI in 1998. Which other company, with a bid of \$28 billion, lost out?

- (A) AT&T
- (B) France Telecom
- (C) GTE
- (D) SBC Communications

4 What's the name of the penguin mascot for Linux?

- (A) Fred
- (B) Opus
- (C) Penny
- (D) Tux

5 What was the name of the user group formed by Art Beckman, then of Pacific Gas & Electric, in 1990?

- (A) Network Applications Consortium
- (B) Tele-Communications Association, Inc.
- (C) Netscape Users Group
- (D) Bay Area Denial-of-Service Association

6 What was the name of the company Eric Benhamou co-founded and was later merged with 3Com?

- (A) Bridge
- (B) CrossComm
- (C) Proteon
- (D) Xylan

7 Which company sold multiplexer maker Timeplex to Ascom in 1991?

- (A) AT&T
- (B) Newbridge Networks
- (C) Rolm
- (D) Unisys

8 Carriers Sprint and Qwest Communications were spawned by the same railroad company. Which one?

- (A) Baltimore
- (B) CSX
- (C) Southern Pacific
- (D) Union Pacific

9 Which product was the victim of the "RedButton Bug"?

- (A) NetWare
- (B) Windows NT
- (C) Netscape browser
- (D) OS/2

10 Who played Bill Gates in the TV movie "Pirates of Silicon Valley"?

- (A) Matthew Broderick
- (B) John Cusack
- (C) Anthony Michael Hall
- (D) Robert Downey, Jr.

11 Who followed Ken Olsen as Digital's CEO in 1992?

- (A) Craig Barrett
- (B) Bill Howe
- (C) B.J. Johnson
- (D) Robert Palmer

12 What's the area code for Research Triangle Park in North Carolina?

- (A) 818
- (B) 919
- (C) 402
- (D) 413

13 Which network company used to call attention to itself at trade shows by using a booth shaped like a giant train?

- (A) Extreme Networks
- (B) Foundry Networks
- (C) Network Engines
- (D) Packet Engines

14 What was the original name of high-speed routing and switching company Foundry Networks?

- (A) Johnson Networks
- (B) Centillion
- (C) HiperSpeed Networks
- (D) StarRidge Networks

15 When did Cisco ship its first product?

- (A) 1986
- (B) 1987
- (C) 1988
- (D) 1990

ANSWERS:

All 15 correct: You should be editing *Network World*.

10-14 correct: Go ahead, buy yourself that new Palm. You deserve it.

5-10 correct: No tchotchkes for you at your next trade show.

Less than 5 correct: How'd you get your job?

1. C; 2. A; 3. C; 4. D; 5. A; 6. D; 7. D; 8. C; 9. B; 10. C; 11. A; 12. B; 13. D; 14. D; 15. A

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Broadband: Get ready for a trip on the wireless side

By Carolyn Duffy Marsan

Network industry pundit Frank Dzubeck is ultrahigh on ultrawideband wireless. The president of Communications Network Architects in Washington, D.C., predicts new wireless technologies will finally make it economically feasible for companies to snip their LAN cables for good.

"You will start to see the demise of wireline LANs — in most premises for small and midsize businesses," Dzubeck says. "The reason is some of the new local-oriented wireless technologies, especially ultrawideband, will meet the 100M bit/sec needs of the future."

Dzubeck says end users are going to demand 100M bit/sec Internet access at the desktop, and 80% of corporate desktops ultimately will get that access via wireless. Ultrawideband wireless is scheduled for FCC approval this spring, and Dzubeck predicts it will become widely used in office environments by 2003.

"Ultrawideband may destroy technologies like Bluetooth [a competing radio technology that enables ad hoc networking between portable devices] because it is more economically feasible," he says. "I think we'll see it first in branch offices and remote offices, but over the horizon it'll be ready for enterprises."

Dzubeck is also gung-ho about wireless in WANs, with fixed wireless services providing broadband speeds to office buildings and small to midsize businesses. The largest corporations will opt for point-to-point wireless in locations where it is difficult to lay fiber optics, he says.

One wireless initiative that Dzubeck is down on is 3G, the 2M bit/sec wireless data access initiative launched in Europe. "We don't see a huge explosion of 3G services," he says. "We think we'll see a refocusing of the

Enough with the past. On to the future. We've assembled some of the most reliable, grizzled (well, a couple of them) and worldly wise pundits to look through our "seer specs" and let us know what the future holds in areas from the Internet to telecommunications.

VISION QUEST

industry around [5-10M bit/sec] because 3G doesn't offer enough new capabilities for the upgrades to occur. And you'd have to throw everything out when 4G comes along."

In addition to wireless, the other trend Dzubeck is excited about is VPNs. He predicts VPNs will deliver more WAN services and on a much greater scale to companies than they do today. That

means service providers will need to build IP-based networks on which they can deliver high-quality, guaranteed services.

"By 2003-2004, we're going to start to get a granularity of network services based on the transaction, with every transaction having its own quality of service," Dzubeck says. "If I'm doing an XML/EDI [electronic data interchange] transmission to a bank for payment, I may need an entirely different quality of service than if I'm accessing the Internet for a database lookup."

Network services, he says, will become more intelligent and will be outsourced to providers that can offer a higher grade of service with less management required. These providers will bill customers based on usage, not on a flat rate.

Dzubeck prefers a subscription service, in which customers purchase network services on the level of bandwidth and quality of service required. Corporations will manage these types of services, but let carriers implement and deliver them.



Frank Dzubeck, president, Communications Network Architects, is ultrahigh on ultrawideband wireless.

Carriers: Looking for money in the wrong places

By Tim Greene

During the next three to five years all service providers will scramble to recover revenues they thought they would get from e-business.

With traditional retailers finding it less urgent to become e-tailers, providers that built networks to support online commerce must find some other way to make money off these new networks, says Berge Ayvazian, president of The Yankee Group.

"Service providers had been gearing their networks for a very high growth rate of IP and commerce-related services. How is that going to be paid for? If the Internet market isn't growing at the rate that was predicted, that's a big problem," Ayvazian says.

Providers will try to sell e-commerce services to smaller businesses than they had intended in an effort to make money off the infrastructure. They will also branch out into other bandwidth-intensive, IP-based offerings such as application hosting.

"Expect things that build off hosting as a primary area of innovation. Hosted apps. Hosted enhanced services. Things that take advantage

of the infrastructure but go well beyond it to take the requirements off customers to develop their own applications," he says.

If an enterprise customer needs a customized SAP platform, it might do well to hit up a service provider to write the application for them. Carriers are hungry enough to work at bargain prices. "Things would cost an arm and a leg that when there was a very tight market could be acquired from a third

party much more cost-effectively right now," Ayvazian says.

As they scratch and claw for customer dollars, service providers will cease network construction in an effort to cut expenses and shore up the bottom line, Ayvazian says. "The build-it-and-they-will-come era of the '90s is clearly over. Someone who wants to be a national provider will have to use facilities built by somebody else and do some horse trading," he says.

That includes the major carriers such as the regional Bell operating companies and AT&T, as well as newcomers

such as Global Crossing. And some experienced carriers formerly insignificant in the U.S. will become major players.

"The Deutsche Telekoms, the France Telecoms, the NTTs that by now have been able to acquire substantial assets domestically, they're going to have to be viewed by customers as part of the domestic market. A lot of consolidation is going to come from these guys," Ayvazian says.

All service providers, not just the new ones, face the same tough environment. "What's odd about this time is there isn't any David and Goliath story here. All companies are being faced with the same problems. It's not like somebody's being toppled. Whether you're an insurgent or an incumbent, you are facing the same challenges right now."

Software: Adrift in a sea of services

By John Cox

Software is losing its moorings, according to Judith Hurwitz, president of Hurwitz Group and a 20-year veteran of software trends and fads.

The traditional anchors of packaged software and application development have been client/server, Microsoft operating systems and the PC. Now it's about Internet technologies, such as Web protocols (HTTP and XML), servers with browser or other so-called thin clients, handhelds, and reusable software components based on the Java or Microsoft's .Net component models and application frameworks.

"There's not a center of gravity for software right now,"

Hurwitz says. "Microsoft has taken its hits in the market and no one else has stepped up to the plate and said, 'Follow us, boys.'"

The 'Net and the Web are shifting the enterprise focus subtly but importantly from the operating system to the network. Software vendors and enterprise developers are moving applications to the Web. So-called open source software, such as the

Linux operating system and Apache Web server, are giving some enterprise customers greater independence from software vendors.

Over the next few years, Hurwitz says, companies will use these Internet technologies and standards to make their software infrastructures more modular and flexible. Early Web and e-commerce projects by enterprise IT groups often were thrown together quickly. "They built stuff that didn't scale," she says.

"We have to get to the point of creating an 'information utility,'" she says. "You can see this [direction] reflected in Microsoft's .Net and in Java, where you have a common set of elements that form an [underlying] infrastructure, and you plug into it via APIs. This approach will let you buy 'best-of-breed' applications and have them work together without crashing into each other."

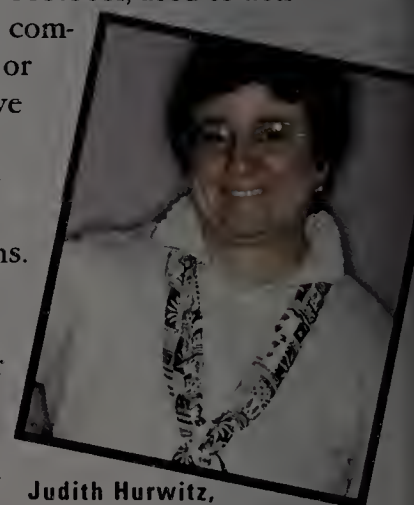
To this end, Sun and Microsoft will pick up the pace in incorporating new Internet standards into their software platforms for smoother interoperability and integration. XML will quickly solidify

its role as the common language for representing and sharing data over the Web. Another emerging industry standard is Simple Object Access Protocol, used to activate remote software components such as Java or ActiveX. An alternative mechanism, called ebXML, is being positioned for complex e-business transactions. In the future, a standard called Universal Description, Discover and Integration, akin to a Web directory service, will let applications search, find and interact with each other.

But even as companies create this information utility, Hurwitz predicts it will be a transition point as a new breed of hosting companies use the same Internet technologies to create services that can take over big chunks of enterprise computing. Companies, in effect, will rent software or net services they formerly bought or built themselves.

"Within five years, enterprise users will not build these services themselves," she says.

Berge Ayvazian, president, The Yankee Group, says look for innovation around hosting.



Judith Hurwitz, president, Hurwitz Group, thinks software is losing its moorings.



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"Service providers will come into being to create all this, and then sell metered services to large and small customers."

E-commerce: Directories, security, XML at the core

By John Fontana

If Jamie Lewis were a player for his beloved Atlanta Braves, he'd have a solid bat and a steady glove built on his devotion to the mechanics of the game.

But because he's CEO of The Burton Group research and consulting firm, his professional focus isn't on balls and bats. But his devotion to mechanics remains.

During the next five years, Lewis says, key network mechanics will include directories, security and XML. They will be woven into a general purpose IT infrastructure stretched seamlessly across corporate boundaries to support user management and security access controls beyond corporate firewalls. The weave will form the fabric of e-commerce.

By 2006, IT will build this infrastructure.

The next three years will be a landscape of fits and starts as behind-the-scenes standards and interoperability mechanisms are hammered out. Then, in 2004 and beyond, tangible products will start to emerge.

Directories, as Lewis has preached for years, are central to creating provisioning systems for adding, deleting and authenticating users.

"The huge leap is to the next level outside the firewall — where you have your own internal systems, those of your partners, suppliers, customers and service providers,"

Lewis says. "It has to have an integrated, seamless and secure provisioning environment that we don't have today."

The other question is how do you securely share user rights across interconnected systems?

"There is a market pressure now to develop a scalable and more manageable security environment to enable this type of provisioning system," Lewis says.

One example may be the

recently proposed Security Services Markup Language, which lets user credential and access rights be shared across sites regardless of the existing security infrastructures.

The merging of directories and securities will ignite the creation of business Webs, groups of companies linked through a network to provide a common function; and business-to-business relationships and marketplaces held together by an all-purpose communications highway of XML middleware.

Without this system, Lewis says e-business will have a hard time being scalable and manageable. Other linchpins also are needed.

"When you add users, actions have to occur based on that," Lewis says. "That is where workflow and the message-based middleware kicks in and things start to happen. An account gets created, your billing system kicks in, rights are granted or revoked."

XML will form the standard communication layer between applications and services, and between services and between applications. The directory will have to be able to communicate in XML.

"In the short term, we will see lots of struggles over XML standardization," Lewis says. But in four to five years, progress toward the definition of baseline fundamentals should emerge.

The WAN: The all-optical company

By Phil Hochmuth

Fiber from the desktop to the WAN; server-less companies; minimal IT departments; rented applications on demand — this is the future for many enterprise network infrastructures,

according to Tere' Bracco, director of e-business infrastructure for research firm Current Analysis.

"I think the most important thing happen-

ing in the near future is the emergence of the all-optical enterprise," Bracco says. Category 5 copper cabling represents close to 80% of installed network cable in companies, and network vendors are finding successful business in pushing Gigabit Ethernet over copper. But Bracco says the trend in new cabling installations is leaning toward fiber, and she expects

it to soon become as commonplace as copper. Fiber-optic network cable "will become the Category 5 cabling of the future," she says.

This is no great revolution, Bracco says. But the results of having fiber from the desktop to the LAN backbone and even to the WAN (thanks to optical metropolitan-area service providers) will let companies take on rich, high-bandwidth services that will make the IT department of tomorrow look different than what many organizations have now.

With huge data pipes not only running into buildings but to individual desktops, running videoconferencing and hosted applications will become as commonplace as having an e-mail client, a Web browser and an office productivity suite installed on a client PC. In addition to hosting client programs, enterprise database applications, which once required on-site, back-end servers, will be accessed from off-site hosting facilities that could be across town or in the next state.

With fiber everywhere and applications being pumped in and managed from the outside, Bracco foresees day-to-day LAN upkeep tasks being relegated to less-technical employees. Instead of dealing with application management and configuration problems, employees will order applications when they need them and call the service provider when problems arise.

"With bandwidth on demand and applications on demand, businesses will be able to call their service providers and say, 'We need PeopleSoft during these hours and this much bandwidth during these hours,'" she says.

What will transport these applications and on-demand bandwidth, Bracco says, will still be Ethernet — Gigabit over copper at first, then fiber running at 10G bit/sec over fiber.

"We're going to see Gigabit everywhere before we see optical everywhere," Bracco says. ■



Jamie Lewis, CEO, The Burton Group, says the next three years will be full of fits and starts.



Tere' Bracco, director, e-business infrastructure for Current Analysis, says we'll see Gigabit nets everywhere before optical.





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WHAT IF?

By Mark Gibbs

Ever have a few drinks with friends and start playing “what if”? You know, what if I had gone to a different college? What if I had married someone else? What if I had become an accountant?

The possibility that we could have done better, come off worse, been happier, gone further, whatever, fascinates us not only when things go wrong but also when things go right.

Now in the 15 years that *Network World* has been covering the network industry, we’ve seen amazing changes in products and technologies as well as radical changes in the fortunes of various companies. But what if things had been different?

So let me buy you a drink and let’s play “what if.”

The way we’re going to play is to start with the reality. For example, Cisco is an amazingly successful company that knew what it was good at. Now we go to fantasy. What if Cisco had failed to commercialize routers or, more likely, got distracted?

There must have been a point when some executive in Cisco said: “Hey, everyone is making out like bandits building gaming consoles, we should be in that business!” The consequence might have been Cisco owning that market, and Nintendo and Sega becoming also-rans.

1986: Reality — The National Science Foundation (NSF) created NSFNET.

Fantasy — NSF didn’t have enough money and NSFNET didn’t get built. This slowed the growth of the ‘Net by a half dozen years and the Internet Engineering Task Force and Internet Research Task Force were never formed so the big dogs of the computer industry drove the standards process. The result was that cost and limited reach of the ‘Net kept it out of the public’s grasp until 2000. By then, AOL was so powerful and ubiquitous, no one cared about the Internet anyway.

1987: Reality — Kaypro, the king of CP/M luggables (remember CP/M? — it came before MS-DOS), lost \$19.4 million on sales of \$21.8 million. This drove the company into Chapter 11 bankruptcy proceedings and a long slide into obscurity.

Fantasy — Kaypro survived this blip and went on to become a PC manufacturing powerhouse. It was so successful that Compaq, Dell, Gateway and others never got a chance to get big, and Kaypro today has 80% of the PC market and all PCs look like high-tech ice chests.

1990: Reality — Microsoft ended its OS/2 development partnership with IBM and went its own way with Windows 3.0.

Fantasy — Microsoft stuck with OS/2, failed to develop Windows 3.0, then IBM bought Microsoft a couple of years later when the stock price tanked. Bill Gates left after a year and went broke trying to build electric scooters for a mass market that didn’t exist. He now lives in a small duplex in San Luis Obispo and is a cashier at Staples.

1991: Reality — Tim Berners-Lee developed the World Wide Web.

Fantasy — He didn’t. He created the World Wide Library with a counterintuitive system for finding and accessing “books.” The system was quickly forgotten.

Gopher was adopted instead. Nobody really cared much about it. AOL became the de facto Internet access tool.

1993: Reality — NCSA Mosaic for X Window, created by Marc Andreessen and Eric Bina, was released.

Fantasy — As Berners-Lee didn’t produce the World Wide Web, forget that release. Andreessen remained in obscurity until leaving NCSA and achieving an entry in the Guinness Book of Records for the greatest number of body piercings.

1994: Reality — Computing power continued to grow according to Moore’s Law.

Fantasy — It didn’t. By 1995 the rate of adoption of PCs slowed to a crawl and mainframes began to re-establish their dominance in corporate computing. A long, sullen silence fell over data processing as glass houses expanded to accommodate the raw machinery. The Internet was small and quiet and spam was never invented. AOL became the de facto Internet access tool.

1997: Reality — Eric Schmidt, formerly Sun’s CTO, took over the reins at Novell. Novell became moribund a few years later.

Fantasy — Larry Ellison resigned from Oracle to run Novell and introduced the company to the art of marketing. In 1999, Novell performed a hostile takeover of Sun and merged with Time Warner in 2001. Ellison appeared as the cover model on the *Sports Illustrated* swimsuit edition.

I could go on revising history all night (or until the bar closes), but I’m about to run out of space. What is so intriguing is that there were so many points in the past 15 years where any or all of the industry could have headed off in a different direction. But of all the possible versions of the present that we might have preferred to see, at least in this one AOL doesn’t own the Internet. Yet.

Check with me in another 15 years — we’ll play “what if” again. Next time, you get to buy the drinks. Cheers. ▣



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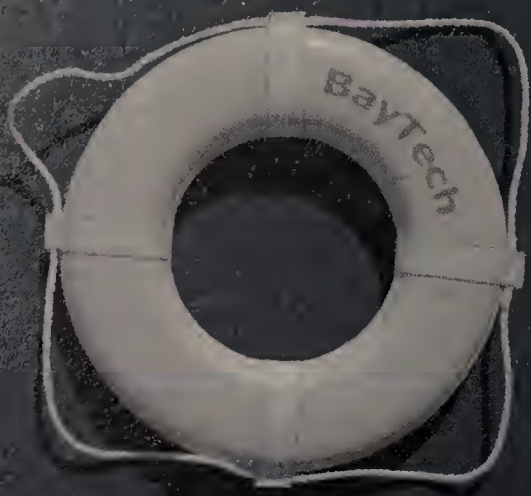
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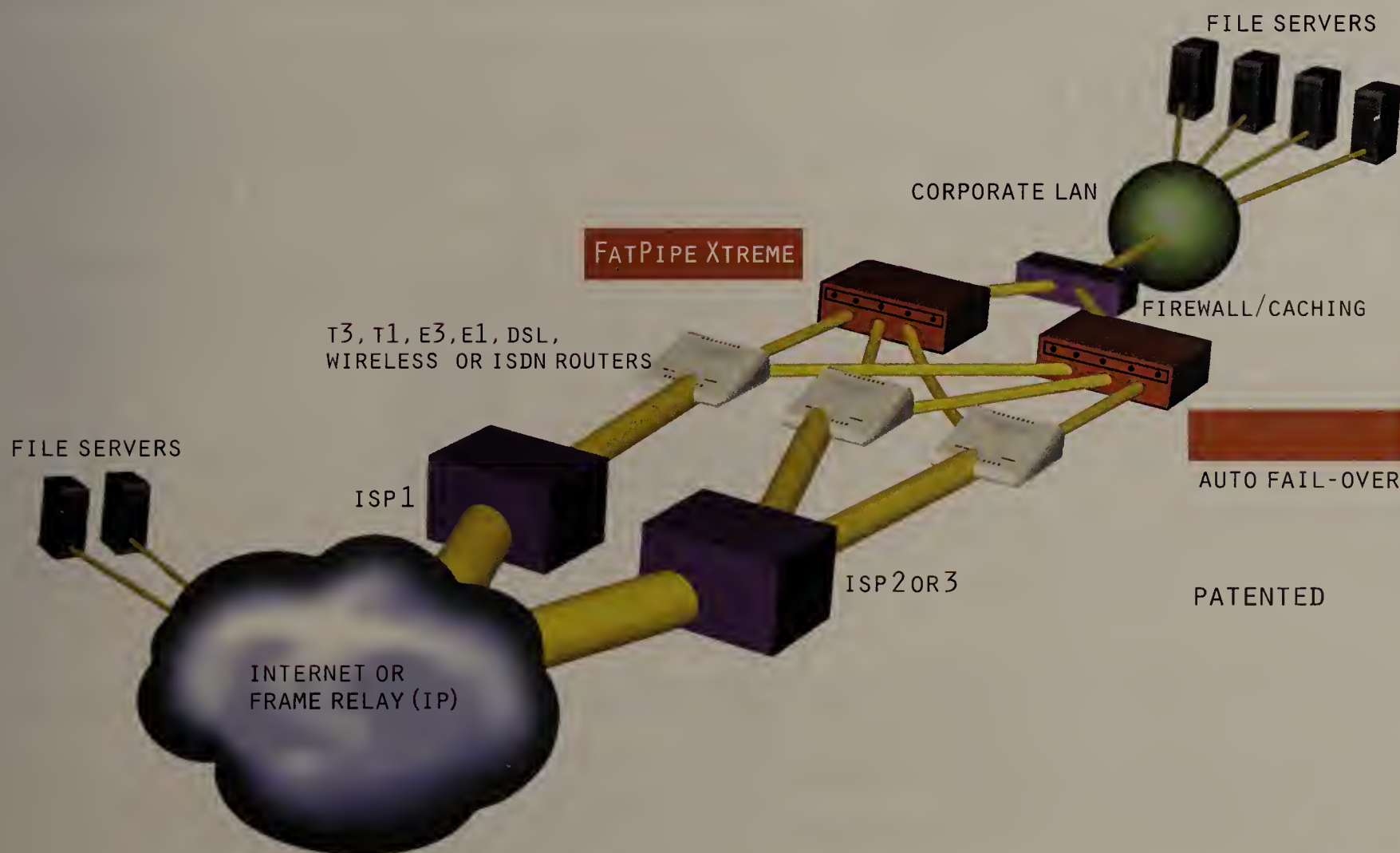
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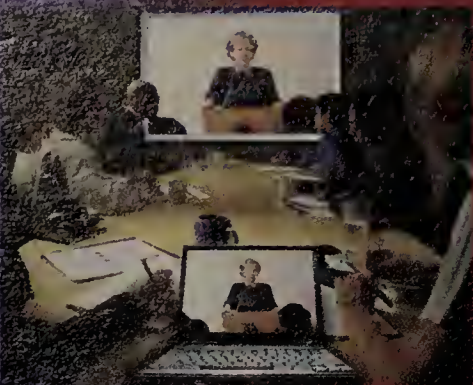
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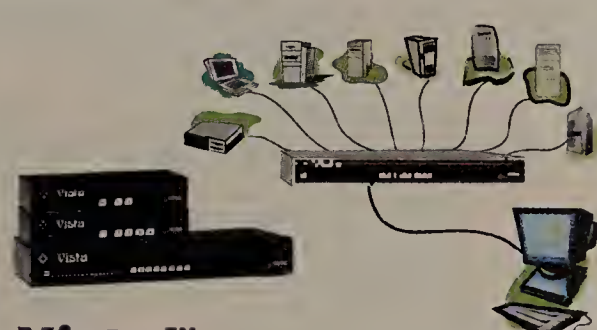
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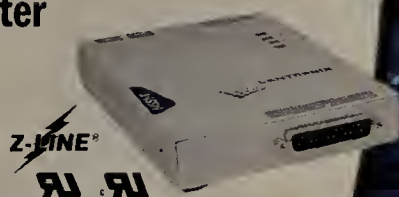
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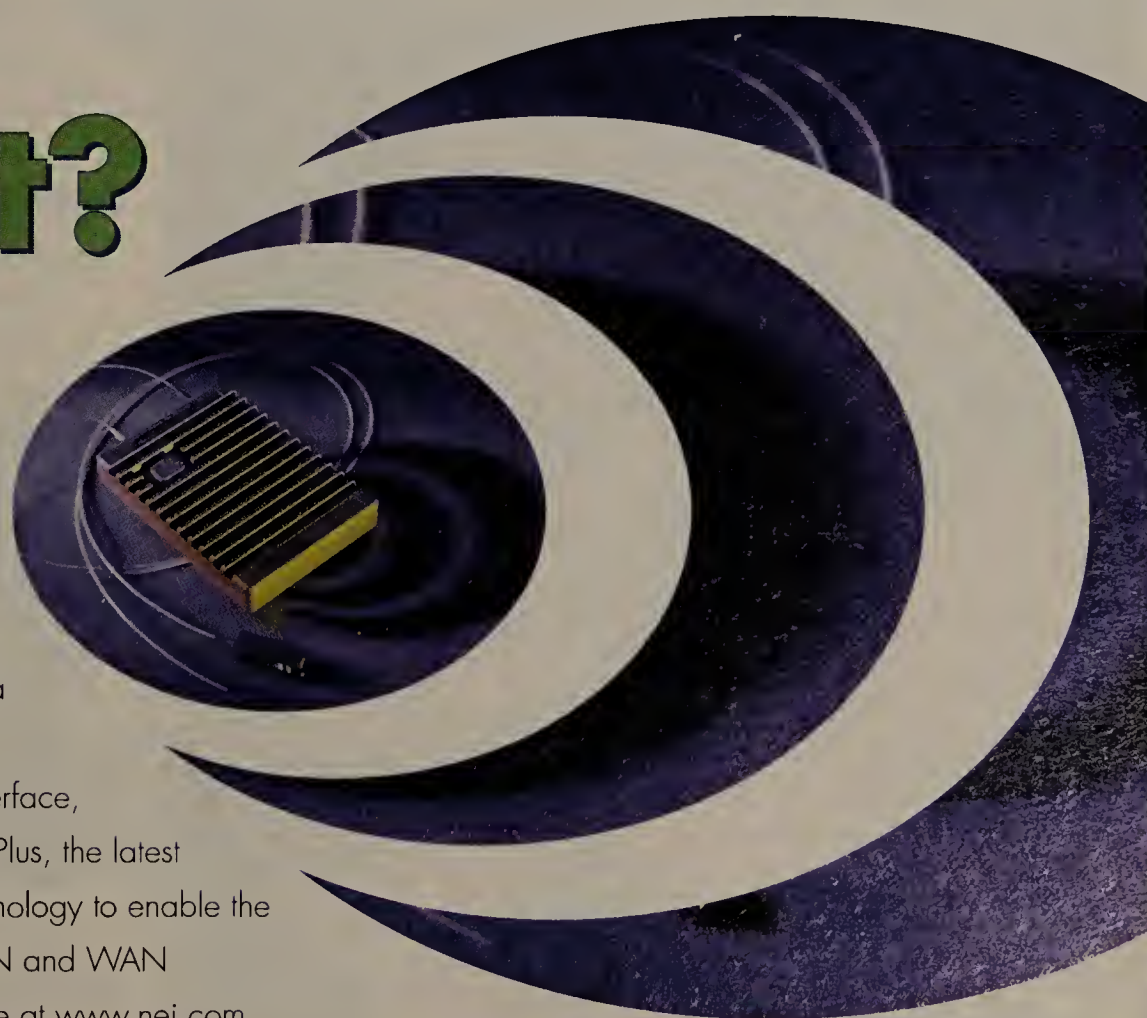
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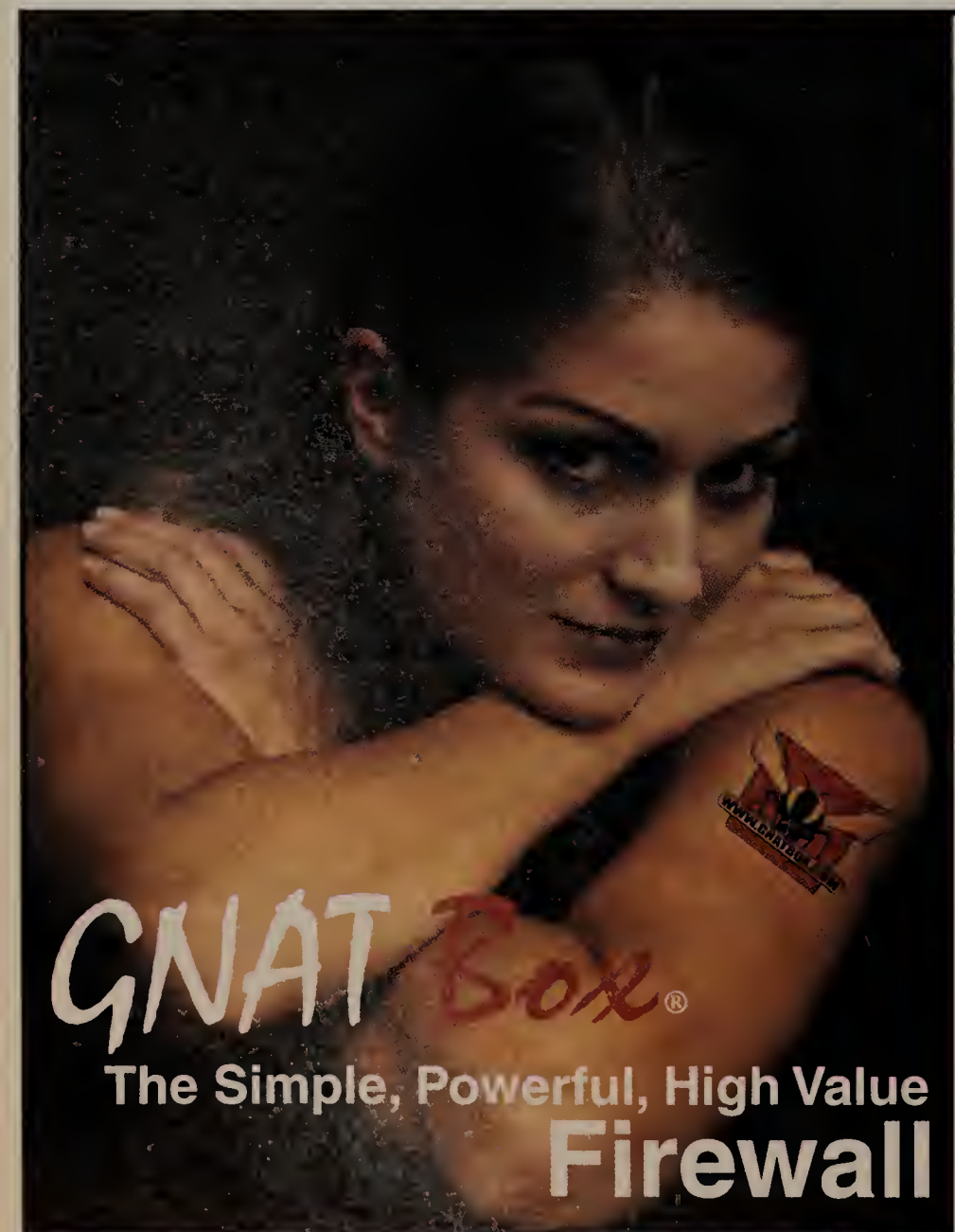
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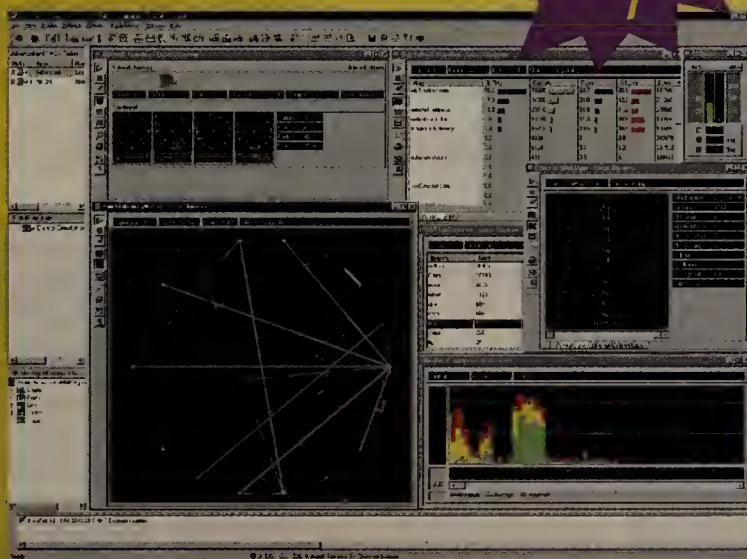
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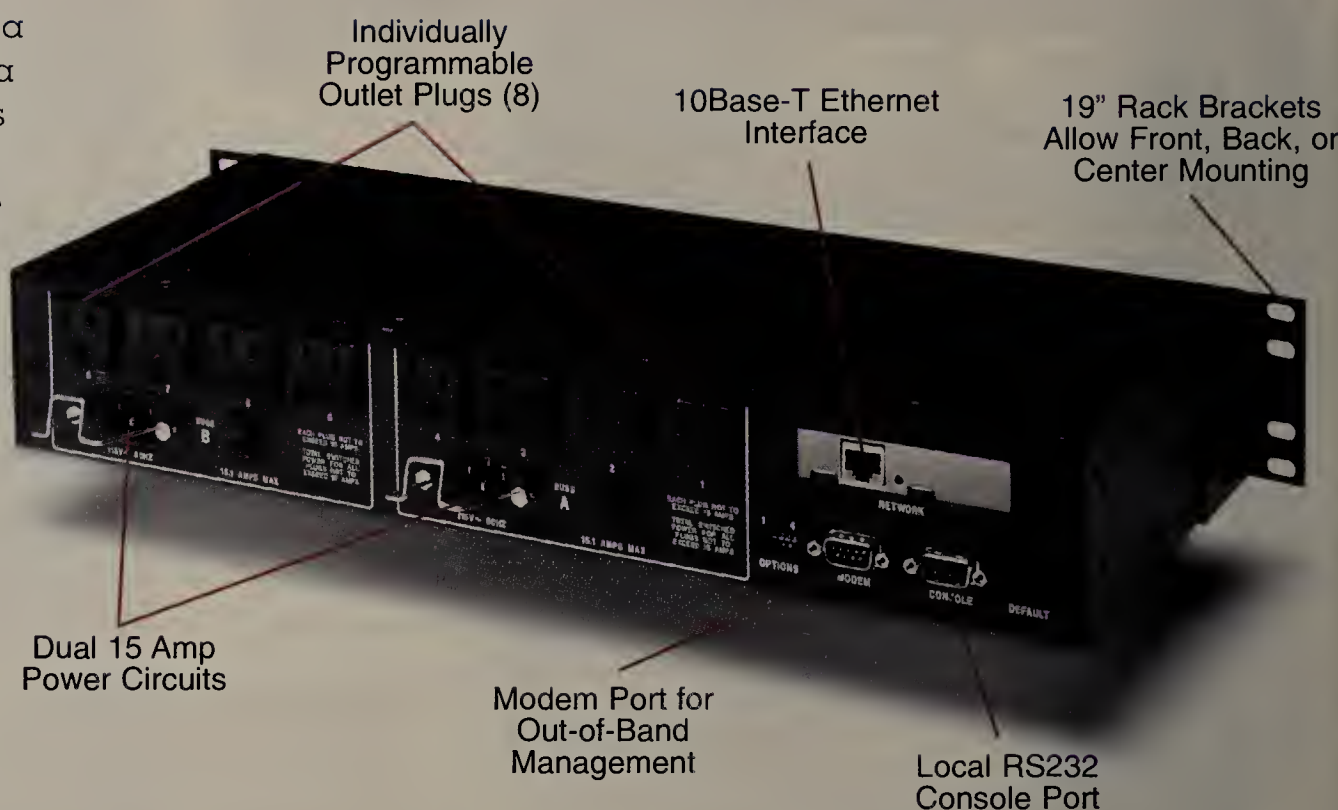
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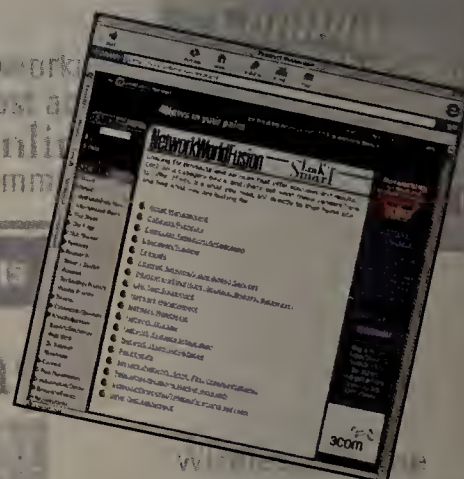
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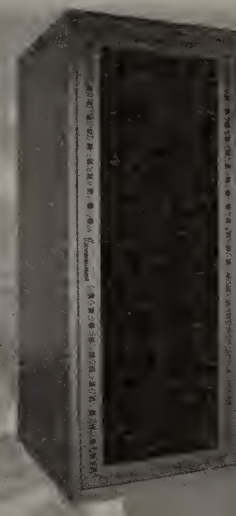
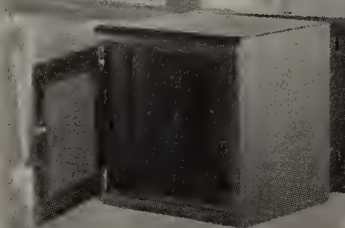
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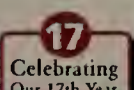


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SENIOR CONSULTANT - wanted by software development company. Requirements include a Bachelor's degree in Computer Science or related field or equivalent with 5 years experience in a related field. Travel may be required. Please respond to: Robyn Federman, HR Representative, IONA Technologies, Inc., 200 West Street, Waltham, MA 02451.

Eatel, a provider of telephone and communication services, has multiple openings for qualified **Information Technology Professionals**. For consideration, please contact: Eatel, 913 South Burnside Ave., Gonzales, LA 70737-4258 Attn: Information Technology, Job Code 888 or call Trisha Guidroz, Phone (225) 621-4250. EEO. AAP

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AirFlash, Inc. is looking for a Software Engineer for its Saratoga, CA office. Position requires MS or foreign equiv in CS, Eng or related field. Skills sought: C/C++, JAVA, and SQL. Respond to: HR Dept, AirFlash, Inc. 12900 Saratoga Avenue, Saratoga, CA 95070. For more job opportunities see (www.Airflash.com)

T Tech Computers has multiple openings for its Hayward, CA office for the following positions:

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Application Developers: Design and development of web based Customer Relationship Management Tool (DealerKid) Using HTML, Visual Basic and ASP on Windows NT/2000 platform with IIS, SQL Server and Visual Interdev.

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Senior Systems Software Engineer sought by company that provides satellite television in Littleton, CO to work in Littleton & other unanticipated job sites in the US. At a senior level, engage in full life-cycle software development. Design & develop software applications for internal business operations. The applications will be designed & developed in a client/server environment, will incorporate Oracle Relational Database Management Systems & run on UNIX & Windows operating systems. Analyze requirements, create designs & design documentation. Code, test, debug & modify the software applications using Pro*C, PL/SOL & Developer/2000 in the design & development process. Engage in implementation & project management as needed. Requires a Master's degree or equivalent—specifically, requires a master's or foreign equivalent in comp. sci. or related field (incl. comp. eng.), plus 3 yrs. of progressively more responsible exp. in software development that incorporates Oracle Relational Database Management Systems; or, a bachelor's or foreign equivalent in comp. sci. or related field (incl. comp. eng.), plus 5 yrs. of progressively more responsible exp. in software development that incorporates Oracle Relational Database Management Systems. 8am-5pm, M-F; \$66,100/yr. (2 openings.) Respond by resume to: James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver, CO 80202, & refer to Job Order Number JL1117592.

Software Engineers, (\$78K/Yr.), Programmers (\$75 K/yr.) and Sr. Business Analysts (\$80 K/yr.) in A, B, C, D and E: [A]: Oracle 8i.x RDBMS, related tools and Developer/2000 GUI suite in Client Server environments; [B]: Java 2/HTML/JSPs, Java Servlets, OOA, OOD, Web logic, EJB, RMI and Corba, User interface development using JFC, AWT, SWING, and Java beans API. [C]: VS-COBOL-II, NATURAL, ADABAS, DB2, CICS, VSAM, JCLDB2GEN, MAPGEN, TMLGEN, FILE-AID, SUPERC, SPUI, OMF and XPEDITER; [D]: Business Process Reengineering utilizing Oracle 8.0, Developer 2000, Designer 2000, UNIX, C++, VB. [E]: JSP, Java, Oracle 8i, JDBC, J Builder, JSWDC, HTML, CSP, CICS, CS Cobol 11, DB2, REXX, JCL. Software Engineer positions require MS degree & 2 yrs. exp. or BS degree and 5 yrs. prog. exp. in job offered. Programmer positions require BS & 2 yrs exp. in job offered. Sr. Business Analyst requires MS / MBA with 2 yrs. exp. in job offered. HR, Quantum Infotech, Inc., 30600 Telegraph Road, Suite 2220, Bingham Farms, MI 48025 Ph: (248) 593-1924; Fax: (248) 593-1928.

PROGRAMMER/ANALYST

Prepare system requirements using business rules. Develop/deploy application in Java, C++ and COBRA under UNIX environment. Maintaining our own application server written in C++, Cobra server and web servers; Develop Pro C, SOL code generation tools. Interact with users & develop application according to their requirements. Maintaining database servers & monitoring network traffic using scripts. Conduct the development status meetings. Maintain code version controller (SABLIME). Required: Bachelor's degree in Computer Science/Engin or Related & 2 years exp. in programming. \$55,000/yr Send resume to Workforce Services attn. Pat Redington Job Order #3061203 140 E. 300 S. SLC UT 84111

Systems Analyst. Design and code an integrated database system and worldwide web application functionality using Visual Basic, Javascript, Visual Basic Script, ASP-Active Server Pages, XML and Microsoft SQL Server in Advanced Windows Server environment. Responsible for troubleshooting debugging, optimizing and enhancing current applications. Develop new applications in support of business changes and growth. Maintain and develop interfacing systems. Document design changes as necessary. Perform other related information technology duties and participate in architectural and overall technical design. Requires: B.S. in Computer or Info. Science, Computer Engineering or related field. 2 yrs. exp. in the job offered or as a Software Engineer, Programmer or Developer. EOE. 40 hrs/wk. Salary: \$60,000/yr. Send resume (no calls) to: Sonya Esber, IGO Development, Inc., 9393 Gateway Dr., Reno, NV 89511.

Senior Software Engineer sought by home satellite design & manufacturing co. in Littleton, CO to work in Littleton & other unanticipated job sites in the US. At a senior level, engage in full life cycle software development. Specifically design, develop & test software applications that control internal company functions such as business management, pay-per-view, & internet applications. The software applications incorporate client/server architecture & run on UNIX or Windows NT operating systems, or are web-based. They also incorporate Oracle Relational Database Management Systems. Analyze requirements, create designs & design documentation. Code, test & debug the new software applications. Use programming languages PL/SOL, UNIX K-Shell, & HTML, & a variety of tools including Designer 2000, Developer 2000 & SOL Loader in the design & development of the software applications. Requires Master's or equiv.—specifically, requires a Master's degree (or foreign equivalent) in computer science or engineering, including electronics & communication engineering, plus 3 years of progressive experience in developing software in a client/server environment; or, a Bachelor's degree (or foreign equivalent) in the field listed, plus 5 years of progressive experience in developing software in a client/server environment. Working knowledge of PL/SOL, UNIX K-Shell, Designer 2000 & Developer 2000. 8am-5pm, M-F; \$76,500/yr. (2 openings.) Respond by resume to: James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver, CO 80202, & refer to Job Order Number JL1117590.

PROGRAMMER ANALYST

Provides training & support in the installation, implementation & utilization of new systems, enhancements & modifications. Provides solutions for various software problems, compatibility of various systems. Continually monitor the performance of programs after implementation to achieve maximum results for clientele. Required: Bachelors degree in Computer or related field plus 2 yrs. Exp. \$60,000/yr Send resume to Workforce Services attn. Pat Redington Job Order #3061204 140 E. 300S. SLC UT 84111

Technical Support Analyst, Chicago, IL Perform systems supporting and configuring operating systems, TCP/IP and computer networks. B.S. and 2 years exp. required. Must have authority to work in the U.S. Send cover letter and resume to: Ms. Rossanne Macias, # 12905, PCS, 1415 N. Dayton, 3S, Chicago, IL 60614.

SOFTWARE ENGINEER

Software re-engineering, code organization & migrations. Developing, deploying, customizing and testing Web pages, Intranet and Internet applications. Using the following languages: Coldfusion, HTML, Javascript, Coldfusion Application Server, Oracle and Sequel Server. Communicate with clients and as needs change, perform application analysis and design. Provide technical support, enhance, maintain and develop systems consistent with user needs. Application development utilizing client server environment in Windows based tools and front-ends. Monitor operation of assigned application systems & coordinate corrective actions as needed, using multiple operating systems such as Windows NT, 95 & 98. REQUIRED: Masters degree or equivalent in Comp Science/Comp Eng/I.T. or related. \$63,100/yr Send resume to Workforce Services attn. Pat Redington Job Order #3061202 140 E. 300 S. SLC UT 84111

Senior Software Engineer sought by company in Glendale, CA that develops software & provides professional services to work in Englewood, CO & other locations in CO. Engage in full-life cycle software development. Design & develop software applications in a client/server environment that incorporates Oracle relational database management system & runs on a Windows NT operating system. Analyze requirements, create designs, & design documentation. Code, test & debug the software applications. Use Designer & Developer 2000 in the design & development process. Provide troubleshooting & user training as needed. Requires a Bachelor's or foreign equivalent in comp. sci. or related field (incl. elec. &/or telecomm. eng.); 3 yrs. exp. in Oracle software development. 8 a.m. - 5 p.m., M-F; \$70,000/yr. (2 openings.) Respond by resume to: James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver, CO 80202, & refer to Job Order Number JL-1117578.

OBJECT TECHNOLOGY

CONSULTANT - wanted by software development company. Requirements include a Bachelor's degree in Computer Science or related field or equivalent with 2 years experience. Travel may be necessary. Please respond to: Robyn Federman, HR Representative, IONA Technologies, Inc., 200 West Street, Waltham, MA 02451.

Systems Engineer needed in Evansville are to work closely with professionals in manufacturing, warehousing and distribution and identify their process control requirements. Implement and maintain computer, networks, peripherals and systems. Requires competency in information technology including FORTRAN, COBOL, SOL and Relational Databases. Familiarity with other languages including C++, WINDOWS. Hardware knowledge including ALPHA, VAX, PCs, IBM mainframe. Bachelor's degree and experience required. Send resume to Judy Winger, Vice President Administration, Warehouse Services, Inc., 2101 Highway 69 South Mt. Vernon, IN 47620

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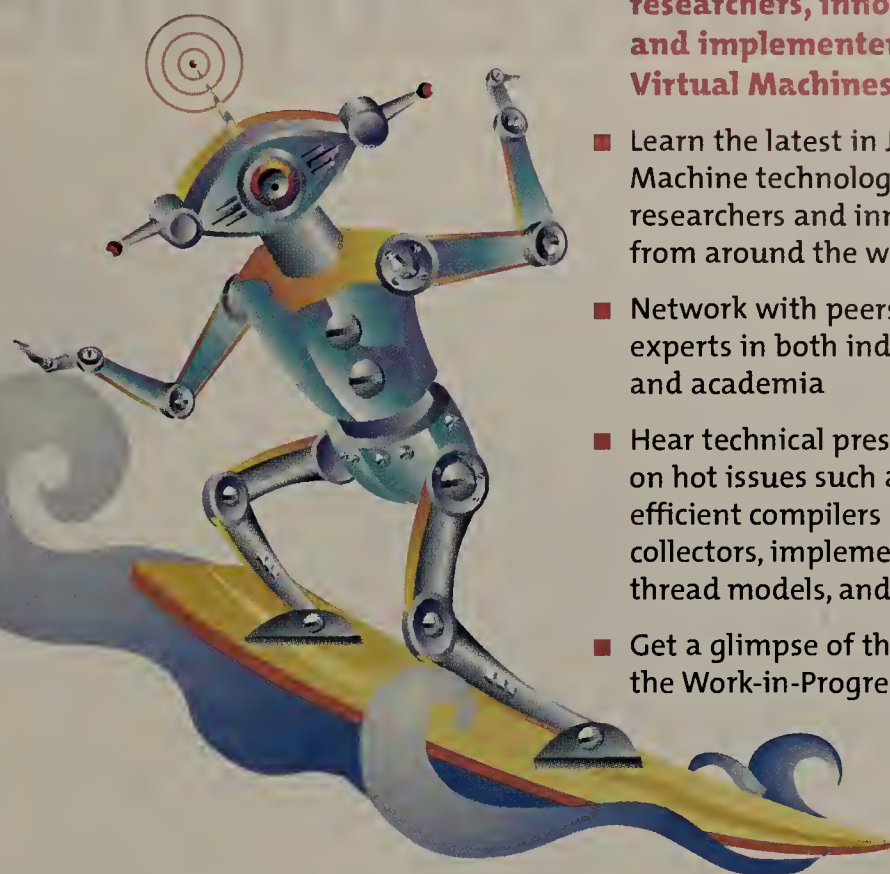
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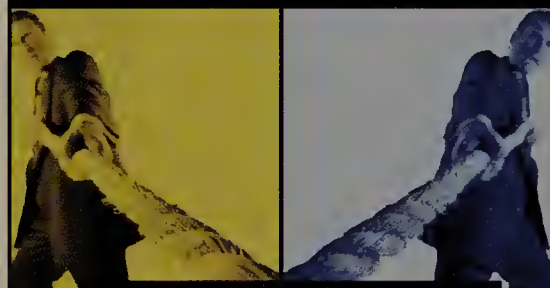
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IT Careers in Web Development



There was a time when working in web development meant getting a page up on the Internet. In 2001, the complexity of web pages continues to escalate. Most companies have learned that web development works its way into most every information technology project, whether dealing with legacy systems or in developing entirely new business processes.

Today's web developers know the technical aspects. Their focus now is on solving problems using web processes, providing for ease of use, driving down the expense for host companies and providing the scalability so needed for web businesses to grow.

BlackHog, Inc. Sunnyvale, CA

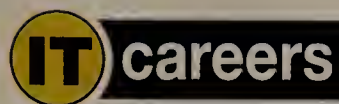
BlackHog is taking online supply chain management to a new level, providing the high technology content and value to host collaborative direct materials procurement. Haam Tham, principal architect for BlackHog, explains that the company began in October 1999 by providing this service to semiconductor equipment manufacturers that include Lam Research, PRI Automation and others. Today, the company has more than 30 clients.

"We came from this (the semiconductor) industry and understand the pains," he says. "We aren't just throwing up a web exchange and seeing who salutes. We've spent a lot of time researching with buyers and suppliers, understanding the environment in which they work and what information they need readily available to them."

The result of this study is BlackHog's hosted web application. BlackHog continues to develop new processes and features to better consolidate information from various sources and achieve a usability that is on par with a PC's interactivity and responsiveness while operating over the web. "The next decade will see the emergence of a new class of software – the inter-enterprise software, which will remove barriers to collaboration between enterprises," says Tham. "We have a number of interesting projects ahead. One is personalization, not in the usual sense but encompassing the gamut, from setting individual preferences to company-specific data attributes to customized workflow. We also are developing new access controls that will provide better control in a multi-level supply chain environment."

BlackHog's ClearLink is a hosted web application and the backbone of the business. To continue the evolution of the product, BlackHog works in teams of domain experts, business analysts, usability experts, interaction designers, graphic artists, quality engineers, HTML/JSP developers, Java developers and database developers. "We look at applicants' resumes for some hint on how they design and structure code, the challenging things they have done in specific projects and how they have grown and achieved," he says. "Of course during the interview stage we look carefully for people who understand the overall design process and who fit into our open culture."

BlackHog is among the leaders in the emerging inter-enterprise management software. "We are among the first players, and our management team really has it together and is committed to creating a company that is built to last," adds Tham. "We use leading-edge technology, and the gang here includes some of the best people I've ever worked with. We have five architects (with 10 or more years of experience, who can mentor and assist in your professional growth), who help provide strategic technical vision. We get our hands dirty with day-to-day design and implementation issues, and we're who you can brainstorm with about new ways to implement pluggable behavior."



Fannie Mae Washington, DC

When the economy slows and interest rates fall, information technology kicks into high gear at Fannie Mae. As a secondary mortgage provider, Fannie Mae supports lending institutions. And in today's economic environment, refinancing requests and transactions are up.

To enable the refinancing flurry today and home financing in general, Fannie Mae provides its services and conducts transactions with its customer lenders via the Internet and using software applications. "We also operate as a paperless organization," says Trang Gulian, staffing manager at Fannie Mae. The net result is a high degree of progressive IT projects calling upon technologies ranging from object-oriented, C++ and Java languages to content management and web-development tools. "We're always looking for people with a strong financial, mortgage or banking background, as well as for people with web-related application development experience," says Gulian.

Fannie Mae IT employees work as consultants to internal and external customers. Challenges include providing speed and accuracy for the back-end support of online mortgage applications to addressing the sheer scalability of nation-wide requirements.

"Fannie Mae has been around for decades," says Gulian. In addition to use of leading-edge technologies, "many people come to work here due to our mission. People can relate to our goal of providing affordable housing for homeowners by offering our services to lenders."

Impact Innovations Group Columbia, MD

Impact Innovations Group views the web challenge over the past few years as two-fold: learning and developing in emerging technologies while hiring and retaining talented web developers. "Today's challenge is much different," says Rich Becker, director of marketing. "It combines the core operations and information of a business with creative branding and design to migrate a first-generation web site toward a business tool that reduces cost and drives revenue."

Impact Innovations' recent web development projects include a mobile inventory tracking system for the Federal Aviation Administration, an online loan origination program for a financial services client, and a business-to-business energy broker system. "In the future, web sites that combine an extremely creative and efficient user interface with world-class web technologies will differentiate themselves from the rest of the pack," says Becker. "The industry has often separated design and creativity from technology, but Impact Innovations is moving toward a more sophisticated model that combines both."

Susan Lane, vice president of talent acquisition and organizational development at Impact Innovations, says the company is hiring account executives and technical

candidates with networking and web-development expertise. The top candidates are those that combine this technical expertise and knowledge of vertical markets with experience in the consulting area.

Impact Innovations serves clients in the government, energy, telecommunications, financial services and healthcare arenas. The company plans to hire about 200 people in 2001, with opportunities in Columbia, MD, Richmond, VA, Dallas and Atlanta.

"In the future, web sites that combine an extremely creative and efficient user interface with world-class web technologies will differentiate themselves from the rest of the pack."

*Rich Becker, director of marketing
Impact Innovations Group*

"We are a mid-sized organization that operates as a Fortune 200 company," says Lane. "When new employees walk through the door, they are assigned a career development mentor. You develop your own goals, and we'll work at helping you get there."

MediaServ, Inc. New York, NY

Over a year ago, MediaServ took a look at its marketplace and made a bold and strategic decision. While the company built a great reputation by building custom applications for eight years, it was time to bring added value in the form of a product. The result is BluePath.

"Our product is designed to enable our professional services team to deliver advanced solutions to our clients," explains Iain MacNeil, director of professional services. "In many cases, BluePath reduces development costs by as much as 40 percent, in addition to reducing risk and time-to-market."

MacNeil says web development has come to mean everything from graphic design to enterprise application development. "MediaServ focuses on our clients' businesses," he says. "We specialize in business intelligence and enterprise application development and integration. We have strategic partners to deliver the front-end web development."

Currently, the company is engaging early adopters of BluePath and continues to work on enhancing both the product and the services provided to customers.

Karen Kugal, who manages recruiting, says the company's hiring focus remains centered on industry experience and business intelligence. "We hire senior people who have proven business experience and a strong technical background," she says.

"At MediaServ we work to harness creative energy at all levels," Kugal adds. "You'll be working with a team that

includes leaders in technology and business. We have a passion for what we do, and this is manifest in our long-standing relationships with our clients."

Satmetrix Systems Mountain View, CA

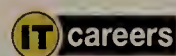
Among the wonders of the worldwide web promise is the ability to measure and manage customer relationships. Satmetrix Systems is the leader in measuring satisfaction levels, serving clients ranging from America Online, Inc. to eBay Inc., Lucent, and Cable and Wireless.

"The company collects, analyzes and reports out information," explains co-founder David Renaud, executive vice president of development and the company's chief technology officer. "Our processes help our clients identify their loyal customers, at-risk customers, what they like and what they don't."

Satmetrix reports the information out to business units or entire corporations via web pages so that the information can be used for future planning. "We are the only company that has this type of platform, where information comes in and is distilled out to be used as a tool by people with entirely different jobs," says Renaud. Among the projects Satmetrix Systems has undertaken is a complete customer satisfaction system for AOL's tech support system. "Everyone who has had a tech support case receives a survey," explains Renaud. "There are about 10,000 survey completions per day, and we can analyze and provide the survey data in a way that drills down to individual performance by members of the tech support team."

Renaud is looking for IT professionals to run the data center, who know networks and servers, and have experience installing software. "Our super-web masters create, stage and test web sites for every client," says Renaud. "We also need pure software engineers to build the tools, people to do content authoring. There are positions for the highly skilled professional, as well as the smart person who has good communication skills, knows how to identify and understand client requirements and translate into our system."

"This is a very sound business," adds Renaud. "We don't depend on ad revenue, have a good customer list, and provide a highly valuable product. And, while we are a leader in this field, we also have a lot of fun. We founded this company on the basis of it being someplace where we would want to go to work – a slightly different motivation, but it's one that allows us to match people up with what they want to do."



For more job opportunities in web development, turn to the pages of ITcareers.

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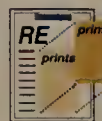


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numerous times after systems became corrupted when removed from the cluster. However, assuming correct operation, the basic tasks — such as creating a cluster and then adding, deleting and managing the availability and health of servers in the cluster — are easy to perform from the MMC snap-in.

We used a New Cluster Wizard to create a general Web cluster, a COM+ application cluster and COM+ routing cluster. We focused primarily on the Web cluster for our tests. After choosing and naming the cluster type, you can specify the form of load balancing. The product primarily relies on Network Load Balancing using two network interface cards in each server in the cluster. However, it lets you use a third-party hardware load balancer. Of course, if you had such a product, the value of Application Center 2000 diminishes, but some features (particularly content replication and server health monitoring) might be useful. We

focused solely on the standard Network Load Balancing without such outside assistance.

Application Center 2000 uses a basic round-robin style of load balancing. To adjust this, you can modify a slider

NetResults

Application Center 2000

RATING: 3.45 **COMPANY:** Microsoft, (425) 882-8080, www.microsoft.com/applicationcenter/,
COST: \$2,999 per CPU. **PROS:** Well-integrated into Windows; powerful content replication features. **CONS:** Only basic load-balancing rules; installation problems; pricey.

	Consolidation 25%	Other features 25%	Management 25%	Installation & configuration 15%	Documentation 10%	Total score
App Center 2000	3	4	4	2	4	3.45

Scoring key: **5: Exceptional** showing in this category. Defines the standard of excellence; **4: Very good** showing. Although there may be room for improvement, this product was much better than average; **3: Average** showing in this category. Product was neither especially good nor exceptionally bad; **2: Below average**. Lacked some features or lower performance than other products, or than was expected; **1: Considerably subpar**, or lacking features being reviewed.

indicating the amount of traffic a server should handle. However, adjustments beyond this gross distribution — such as URL-based, content-based or any form of global load balancing strategies — are not

directly supported. Clever administrators could figure out how a couple of clusters could be built (via redirection rules for Internet Information Server [IIS]) and implement a URL-based form of load balancing, but in short the product only provides the most

plistic load-balancing features. Application Center 2000 has numerous positive features. Content synchronization is particularly strong and should be transparent to the typical Web developer who only has to make a change to content on the cluster controller. The

abilities to gracefully bring a server offline by draining connections and deploy an application through a rolling upgrade are particularly welcome. Lastly, a powerful and positive feature of Application Center 2000 is the multitude of monitoring facilities. It was easy to monitor the health and performance of all the servers in the cluster. As we ran tests to ensure the cluster could handle

bursting loads and survive servers being added and removed from the cluster, we could easily monitor the utilization of the various servers. Server health data were stored in Microsoft SQL Server, and a variety of reporting and analysis options are possible.

The estimated price of Application Center 2000 (\$2,999 per CPU) is troubling if you consider other Web scalability solutions. Even some hardware-based solutions aren't much more than this when you start adding servers.

Application Center 2000 is Microsoft-oriented — it runs only on Windows 2000 servers with IIS and favors Microsoft's Web technologies such as Active Server Pages. This may be considered a strength of the product, but sites with more heterogeneous hardware and software setups should not bother looking at Application

Center 2000, and instead should concentrate on a hardware-based product.

While the administration, monitoring and content deployment features of Microsoft Application Center 2000 are admirable and show its true potential, its simplistic load-balancing options and rough edges make it difficult to recommend, particularly to those new to building Web clusters. If these issues can be smoothed out, Application Center 2000 no doubt will become a good solution for Windows Web site administrators facing increasing reliability and traffic demands.

Powell is the president of Pint, a San Diego Web services firm, and the author of numerous books on Web development practices. He can be reached at tpowell@pint.com.

How we did it

The test cluster was created using two fairly low-end Dell Pentium III systems with 256M bytes of RAM and two clone Pentium III servers with 1G byte of RAM, respectively. All systems had dual 100M bit/sec Ethernet network interface cards. Static and dynamic sites built using Active Server Pages and ColdFusion with SQL Server database backends were tested on the cluster, including a fairly complex Real Estate scheduling Web application currently in production in a nonclustered environment. Web traffic was tested with real user sessions from other systems on the network and simulated load fetching a predetermined list of URLs with a variable range of 50 to 500 simultaneous users.

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basic form of load balancing.

We liked one feature of Application Center 2000 that puts it ahead of overly simplistic schemes such as DNS round-robin. The feature applies to state management issues using an idea called request forwarding. Basically, if a state has to be preserved, the initial server visited becomes the "sticky" server and subsequent requests are forwarded to the server holding the user's state information by any other server in the cluster that receives another request from the end user. Of course, if the sticky server crashes, problems will ensue. In contrast, centralized state management — either via hardware or software — would alleviate this problem, but at the expense of providing a single point of failure for the whole cluster.

Despite the relatively sim-

Intraspect,
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can then use a subset of those policies in populating workspaces without requiring further IT intervention. "You create sandboxes so information can be segregated without central administration having to set security policies for each new site," he says.

Another unique mobility feature of Intraspect 4 is the ability to assign an e-mail address to a workspace or

folder. This lets e-mail be used to add documents to a workspace or folder and for the server to send notifications on work assignments or document approvals to end users.

Intraspect 4 introduces a personal portal and document-management features such as versioning, document approval and file locking. Also new are customization tools, support for Java and XML, and a software development kit.

Intraspect 4 is integrated with Microsoft Web folders and WebDAV-compliant systems so users can save documents to Intraspect directly from other desktop applications. The integration provides drag-and-drop access from the desktop to Intraspect folders.

Intraspect 4, which runs on Windows NT or Sun Solaris, is available now and costs \$800 per user.

Intraspect: www.intraspect.com



Powell is also a member of the Network World Global Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.

HailStorm in a teacup?

o Microsoft announced HailStorm, eh? I don't know about you, but I think hailstorms are something to avoid. The idea of getting pummeled by lots of bits of ice is extremely unappealing. But obviously the term has more positive connotations for the hardy souls in the Microsoft marketing department who are acclimatized to the hostile Seattle weather.

Actually, product naming mistakes occur frequently. The Rolls Royce Silver Shadow, for example, was going to be named "The Silver Mist" until some linguistically inclined fellow pointed out that "mist" means, er, ordure in German.

Be that as it may, with HailStorm Microsoft is supposedly taking a big step into its .Net vision and, well, it will be... well, hum. You

see, from what I can make out from Microsoft and all the sycophantic reportage that always surrounds its announcements, this is supposed to be really important. Alas, what there is to focus on so far is thin.

Allow me to digress yet again and note that I have spotted a profound and sad trend in the computer press over the past few

months. The trend is to review products and announcements and not even look for the warts.

For example, I just test-drove a product called PC-Relocator from AlohaBob and thought it was feature-weak, badly documented and a poor value. Yet a number of authoritative voices in the trades and national publications (including *The Wall Street Journal*) gave it rave reviews.

Perhaps I'm just too picky, but I think not. I think product and technology analysis and review standards have fallen to an all-time low. And that is an important factor in the press' handling of HailStorm, a set of Web services that are part of the framework of Microsoft's .Net strategy.

It appears that HailStorm has something to do with Microsoft Passport (gee, that sounds really new), a Web-based version of Hot-Mail (be still my beating heart),

MSN Messenger, some Web services and what sounds like an Emperor's New Clothes version of Microsoft Message Queue.

The first release of HailStorm will apparently include 14 services including MyAddress, MyProfile, MyContacts, MyLocation, MyNotifications and MyInbox (which will include voice mail and e-mail).

Underlying these services will be an XML architecture. And driving the adoption of HailStorm will be, if Microsoft can get enough momentum going, a raft of relationships that will make HailStorm services — at least in theory — highly desirable. Already eBay has signed on to use HailStorm to, it says, let users track in real time the auctions they are participating in without logging on to eBay.

Microsoft's director of business development in the platform strategy group, Charles Fitzgerald, has been quoted as saying, "The Internet business model needs a reboot," which implies Microsoft is going to be the one to do it. Can you say, "rank hubris"?

And these services will not be free, oh no. You — yes, you there, Mr. and Mrs. John Q. Public — will be expected to pay for the privilege of being test pilots, and in the process put your online financial transactions in the hands of Microsoft.

Someone in Microsoft somewhere must be on illegal substances. First, this salami slicing of the public's pocketbook to make revenue was tried with MSN and failed abjectly. Second, can you say, "gunning for AOL"? HailStorm is the wrong gun. Third, can you say "vaporware"? Fourth, why should we trust Microsoft to be the infrastructure for our online dealings?

I'm not saying that HailStorm is completely without value, but for all I've seen and heard, the reality of HailStorm — and for that matter, .Net — is still not established. Indeed, it looks more like the usual hand-waving by the Microsoft marketing machine than anything else.

Let's just hope that given the apparently serious buy-in by many journalists as well as the likes of eBay, this storm isn't in a teacup.

Forecasts please to nwcolumn@gibbs.com.



MARK
GIBBS

The latest on the Internet industry

Having neither mechanical aptitude nor a trusted mechanic, here's how the conversation goes whenever my 10-year-old Buzzmobile needs repair:

Buzz: "Something's broken and I haven't a clue."

Grinning grease monkey: "Must be your inverse catalytic defibrillator."

Buzz: "How much will that cost?"

Chortling grease monkey: "How much you got?"

A Texas start-up called **JoeAuto.com** is looking to reduce this type of expensive humiliation while claiming a chunk of the \$110 billion car-repair business — 70% of which is handled by smaller independent shops. The company aims to use the Internet as a drive-shaft for a series of 28-bay general-repair centers that will be located in and around major cities. They've raised \$16.5 million to get started, with the bulk coming from Ford.

"Our concept is built around one very simple premise: A customer should never have to visit an auto-repair center again," says JoeAuto co-founder **Randy Vanstory**.

Ha!... In order to fulfill that fantasy, JoeAuto will offer online appointment scheduling and pick-up and drop-off service at your home or office. In addition, customers will be able to actually watch their repairs being done via Web cams located in each JoeAuto center.

Buzz did some chortling of his own when asking about the Web cams — c'mon — but Vanstory made a plausible case.

"Our concept is built around two pillars: convenience and trust," he says. "The trust thing is a little bit harder and the Web cams convey a message of trust. What it says is that we don't have anything to hide." The cameras have been the most popular feature for customers using the JoeAuto test site in Tomball, Texas, he says.

JoeAuto also sees the Internet driving down operating expenses. The theory is that once roughly half of customers use the Web instead of calling to make contact — it's 20% at the test site — JoeAuto can forego the branding exposure that comes with expensive real estate in favor of cost savings found off the beaten path.

When might that happen?

"Consumer habits are going to dictate that to us, but we anticipate about a five-year curve," Vanstory says.

JoeAuto is developing its own online scheduling software, which doesn't speak well of the various companies trying to build businesses around providing that technology. Vanstory says those vendors can handle the scheduling part all right, but stumble when it comes to determining whether his business has the materials and people on hand to do the job at the appointed hour.

Houston residents can look for the first full-fledged JoeAuto center this summer, with Dallas, Austin, Atlanta and Denver slated to follow next year.

Building JoeAuto is going to be a daunting, long-term, expensive undertaking with no guarantee of success.

But it's worth rooting for anyone who can help me wipe the grin off that mechanic's face.

The sickness of the hacker mind knows no bounds. Witness last week's defacing of a Web site hosted by the **Parkinson's Disease Foundation**. Taking credit — if credit is the right word — was a purported 10-member band of knuckleheads from Brazil called... aw, you can read the name somewhere else; they aren't getting "credit" here today.

Targeting major corporations in this fashion — or even tossing cream pies into the kissers of their famous executives — seems pointless enough. But to pick on people with Parkinson's?

Experts say almost all such vandalism can be prevented if network professionals take proper precautions. That's comforting... but beside the point.

Feel free to bonk your horn at me. The address is buzz@nwu.com.



PAUL
MCNAMARA



HOW?

Eric the software engineer
goes on vacation in Scandinavia.
Everyone there does mobile banking
on a wireless phone.
Eric would like to do this back home.
He can't.

KNOW-HOW

Eric the software engineer
goes on vacation in Scandinavia.
Everyone there does mobile banking
on a wireless phone.
Eric would like to do this back home.
He enrolls in the
AT&T Wireless Data Developer Program.
He develops a new wireless app.
He sells it to his bank.
Sweet.

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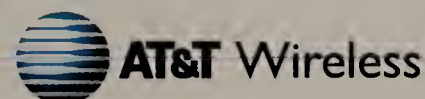
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